

L700 (CTL700) Installation and User's Guide

Abstract

This manual describes how to install and use a CTL700 tape library on HP NonStop™ S-series and HP Integrity NonStop NS-series servers.

Product Version

N.A.

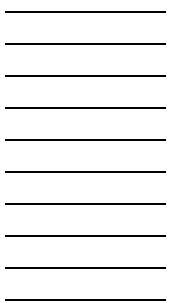
Supported Release Version Updates (RVUs)

This publication supports G06.21 and all subsequent G-series RVUs and H06.03 and all subsequent H-series RVUs until otherwise indicated by its replacement publication.

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L700 (CTL700)

Installation and User's Guide

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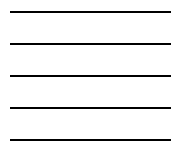
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What's New in This Manual

Manual Information

Abstract

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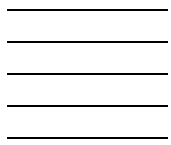
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New and Changed Information

Added support for the M8503 LTO Gen 3 tape drive and configuration for the NonStop NS-series server. See [Appendix D, Configuring the CTL700 Tape Library for the NonStop NS-Series Server](#).



About This Manual

Notation Conventions

Hypertext Links

Blue underline is used to indicate a hypertext link within text. By clicking a passage of text with a blue underline, you are taken to the location described. For example:

This requirement is described under [Backup DAM Volumes and Physical Disk Drives](#) on page 3-2.

Change Bar Notation

Change bars are used to indicate substantive differences between this manual and its preceding version. Change bars are vertical rules placed in the right margin of changed portions of text, figures, tables, examples, and so on. Change bars highlight new or revised information. For example:

The message types specified in the REPORT clause are different in the COBOL environment and the Common Run-Time Environment (CRE).

The CRE has many new message types and some new message type codes for old message types. In the CRE, the message type SYSTEM includes all messages except LOGICAL-CLOSE and LOGICAL-OPEN.

1

Overview of the Tape Library

This section covers:

[CTL700 Tape Library Product Overview](#) [1-1](#)

[Compatibility](#) [1-3](#)

[For support of the tape library connection to a NonStop server, you can use either:](#) [1-4](#)

CTL700 Tape Library Product Overview

The CTL700 tape library is a fully automated tape cartridge storage and retrieval subsystem. Depending on model and features selected, it can store from 168 to 630 data cartridges. The total numbers do not include the cartridges in the cartridge access port (CAP) or the reserved cells.

The exchange rate for moving tape cartridges from cell to cell is 450 exchanges per hour.

Figure 1-1. The CTL700 Tape Library



Tape Drives

The CTL700 can be configured with these tape drives:

CT9840-1 Tape Drive

The CT9840-1 tape drive is a small, modular high-performance tape drive designed for NonStop systems. It features a proprietary design to provide faster average access time, higher data rates, and high capacity. This tape drive comes with a SCSI interface. This tape drive is supported for G06.06 and later RVUs.

CT9840FC-1 Tape Drive

The CT9840FC-1 tape drive is similar to the CT9840FC-1 tape drive. The CT9840FC-1 tape drive comes with a Fibre Channel interface. This tape drive is supported for G06.16 and later releases.

5259 Tape Drive

The 5259 tape drive has been integrated into the NonStop server environment. The tape drive boasts full backward read compatibility with DLTtape for 515x tape drives that have used DLTtape IV cartridge media.

N1521A Tape Drive

The N1521A tape drive is a LTO tape drive that has been integrated into the NonStop server environment. The N1521A tape drive comes with a SCSI interface. This tape drive is supported for G06.21 and later RVUs.

CT9841FC-1 Tape Drive

The CT9841FC-1 tape drive comes with a fibre channel interface. This tape drive is supported for G06.16 and later releases. See Appendix C for [Requirements for the CT9841FC-1](#).

M8503 Tape Drive

The M8503 tape drive is a LTO Gen 3 tape drive that has been integrated into the NonStop NS-series server environment. The M8503 comes with a fibre channel interface. This tape drive is supported for H06.03 and later RVUs.

Power System

The CTL700 tape library power system consists of:

- One or two AC power distribution units (PDUs) that:
 - Operate within a line voltage of 90 to 265 VAC, 50 to 60 Hz
 - Distribute AC voltage to the tape drives
 - Are protected by circuit breakers
- One or two DC power supplies that provide voltage to the tape library

AC Power Distribution Units

When installing tape drives in a tape library that has two AC PDUs, attach each PDU to a separate branch circuit.

Some power configuration examples are:

- For total of eight tape drives, four tape drives can be placed in one column and four tape drives may be placed in the other column. If one AC power circuit fails, four tape drives are operational.
- For a total of twelve tape drives, with six tape drives for Client 1 and six for Client 2, place three tape drives for Client 1 in one column and the other three tape drives for Client 1 in the other column. Split the tape drives for Client 2 the same way. If one AC power circuit fails, each client still has three working tape drives.

DC Power Supplies

If the tape library has two DC power supplies, both of them power the tape library during normal operation. If a fault is detected in one power supply, the second DC power supply assumes control and posts the error to the event log.

Compatibility

The CTL700 tape library can accommodate up to twelve CT9840-1/CT9840FC-1/CT9841FC tape drives, up to twenty 5259 tape drives, up to twenty N1521A tape drives, and up to twenty M8503 tape drives. A combination of all these tape drives can be configured.

Software

For support of the tape library connection to a NonStop server, you can use either:

- The independent product, Silo Media Manager (SMM)
- The Storage Tek UNIX server software, Automated Cartridge System Library Software (ACSLS). You must have a minimum of Sun Solaris 8 and ACSLS 6.0. SF02 is also required to allow ACSLS to run on a NonStop server.

2

Unpacking the Tape Library

This section covers:

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Physically Unpacking the Tape Library	2-4
Removing the Tape Library From the Pallet	2-6
Positioning the Tape Library	2-6
Removing the Shipping Kit	2-6
Securing the Tape Library Position	2-7
Unpacking the Tape Library Interior	2-7

Overview

This section provides the procedures for preparing the tape library site, unpacking and positioning the tape library, and removing the shipping hardware.

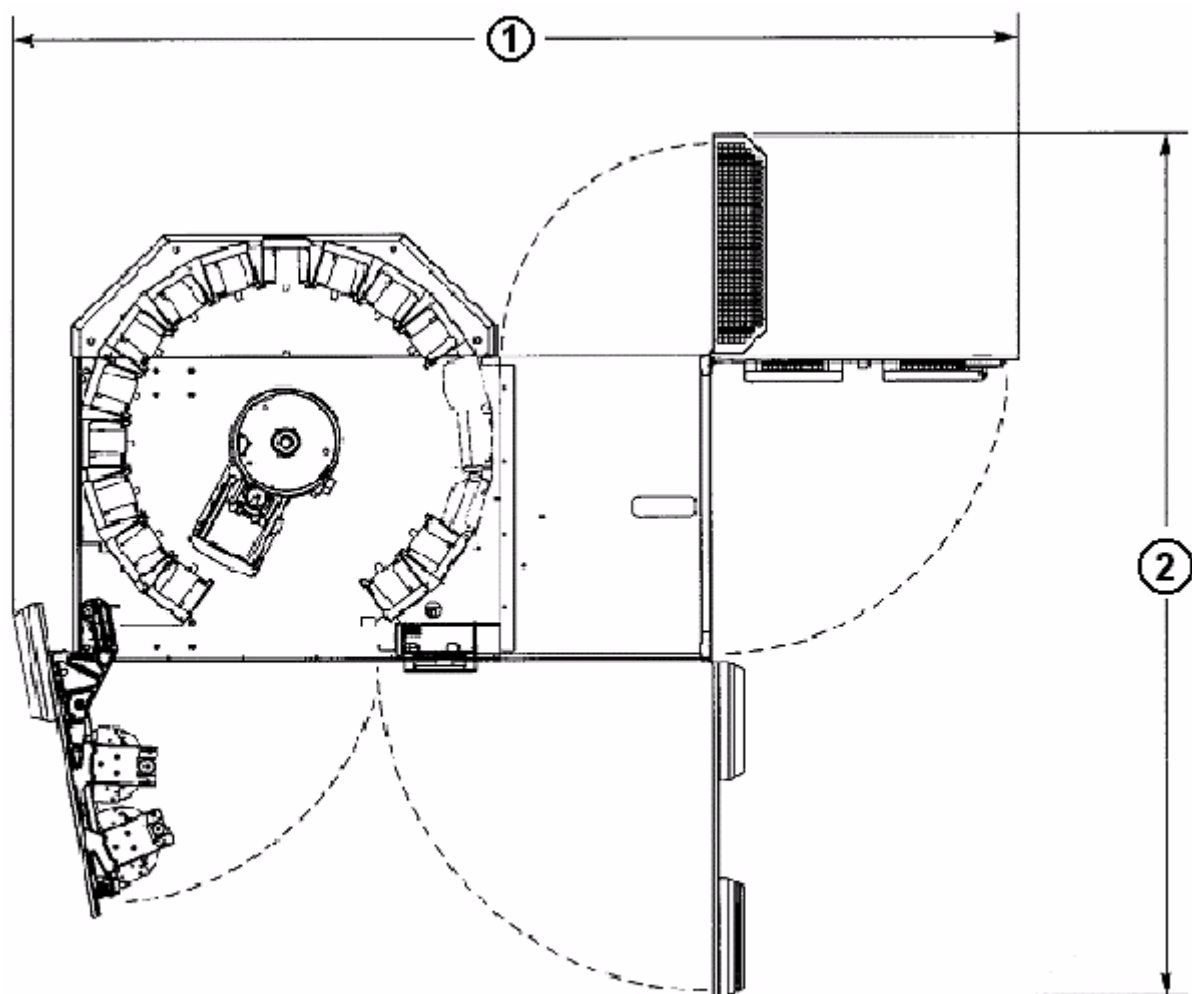
Required Tools

The tools needed to unpack and install the basic tape library and its associated tape drives are:

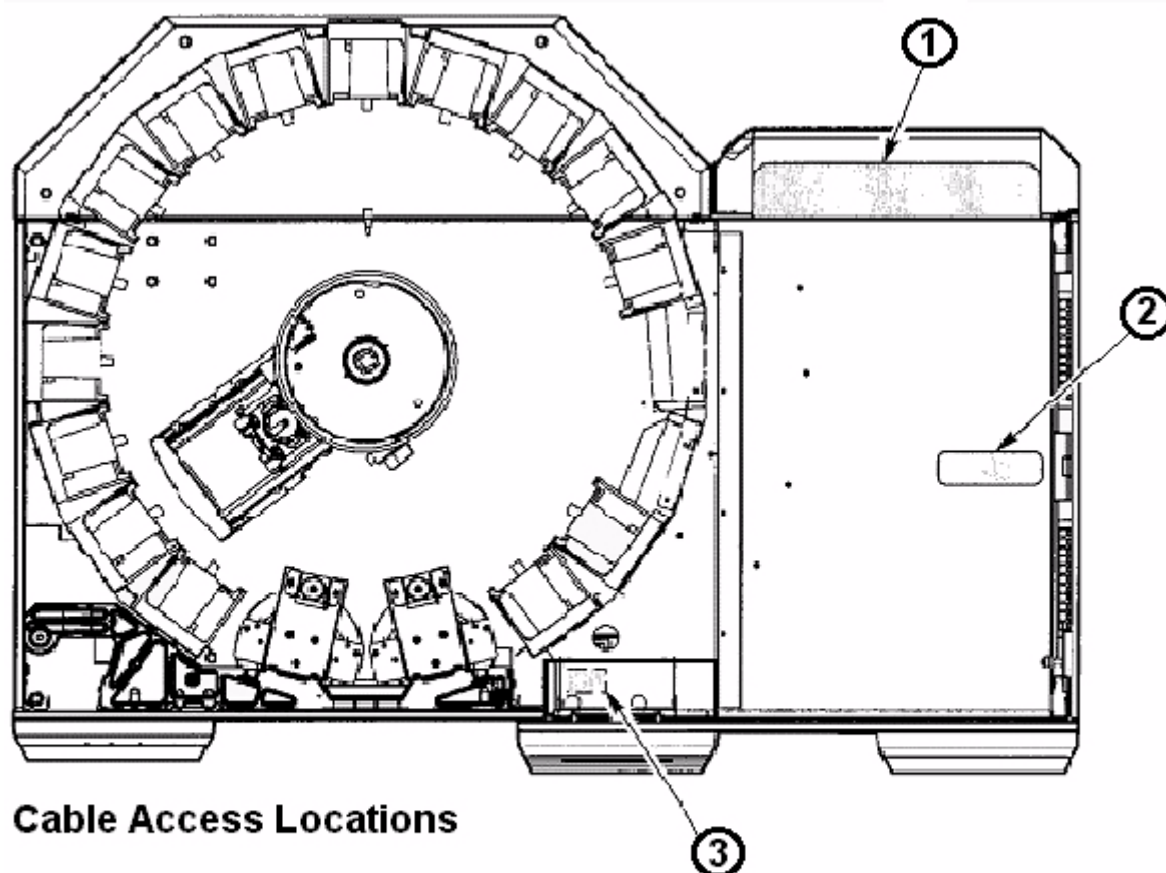
- 3/4-inch wrench, adjustable wrench, or socket wrench
- Phillips screwdriver
- Torx set
- 3/16-inch nut driver
- 5/16-inch nut driver
- Diagonal cutters or knife
- Laptop computer
- RJ45 cable
- RJ45-DB9 adapter

Additional tools needed to install the expansion frame are:

- Adjustable wrench
- Flat blade wrench
- Flashlight

Figure 2-1. Space Needed for CTL700 Tape Library

- 1. Access Door and Right Side Door Open: 2.3m (7.6 ft.)**
2. Rear Door and Right Front Door Open: 2.1m (6.9 ft.)
-

Figure 2-2. Power and Signal Cable Routing

1. Tape drive signal cables
2. Cables to/from 13U cabinet area
3. Power cable

Planning Location

- Allow enough space for the tape library. Plan the signal cable and power cable routing. Provide enough space to open all the doors.
- Provide 15 centimeters (6 inches) above the tape library and 10 centimeters (4 inches) on the sides for cooling clearance.
- [Figure 2-1](#) shows the space needed for the tape library.
- [Figure 2-2](#) shows the locations for power and signal cable routing.

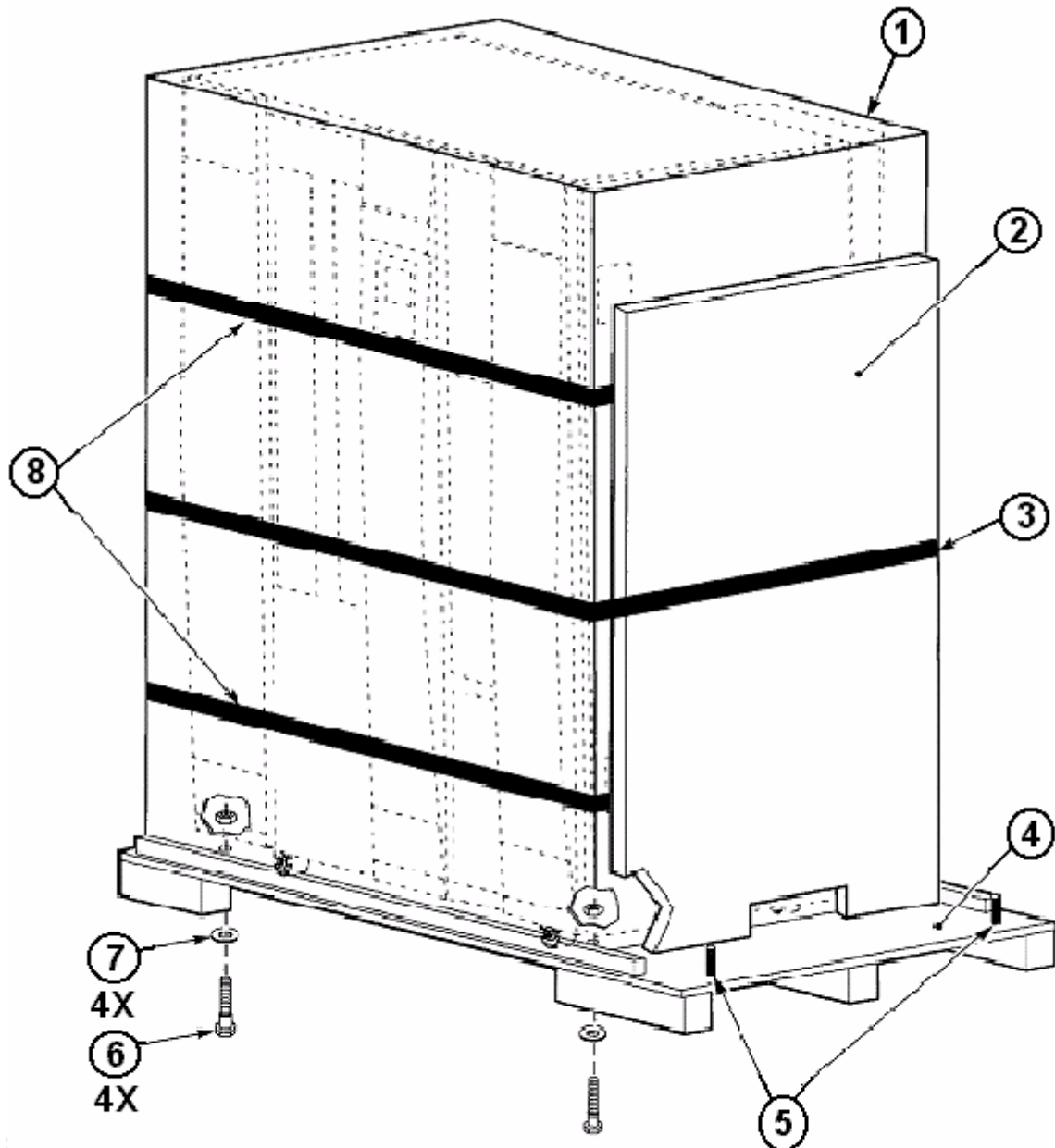
Follow the site guidelines detailed in the *L700 Tape Library Installation Manual*.

Note. To ensure reliable operation, place the tape library in an environment that is free of dust and excessive humidity.

Physically Unpacking the Tape Library

You will need diagonal cutters or a knife to cut the shipping straps. Refer to [Figure 2-3](#) while unpacking:

1. Remove and retain the shipping bill.
2. While holding the shipping ramp against the tape library box covers, carefully cut the wrapping straps on the exterior of the packaging.
3. Remove the ramp and corrugated box covers.
4. Remove the shipping bag (not shown).

Figure 2-3. Unpacking the Tape Library

- 1. Inner shipping box
- 2. Ramp
- 3. Shipping box and ramp strap
- 4. Shipping pallet

- 5. Ramp posts
- 6. 3/4-inch mounting bolts
- 7. Washer
- 8. Shipping box straps

Removing the Tape Library From the Pallet

Note. If shipping agreements require the shipper to remove the tape library from its shipping pallet, skip this section.

△ **Caution.** At least two people are required to remove the tape library from its shipping pallet.

To remove the tape library from the pallet:

1. Obtain a 3/4-inch (or adjustable) wrench or socket to remove the four 3/4-inch bolts that secure the tape library to the pallet.
2. Remove the four wood blocks positioned near the bolts.
3. See [Figure 2-3](#). Position the ramp by aligning the holes of the ramp on the two posts on the pallet.
4. Secure the seat of the ramp on the two posts.
5. With someone on each side of the tape library, carefully guide it down the ramp.
6. Remove the ramp and pallet from the work area. Dispose of the shipping materials or re use them according to your local policies.

Positioning the Tape Library

1. Carefully roll the tape library to its assigned location.
2. Position the tape library to allow space for maintenance and operator access. [Figure 2-1](#) shows these space requirements.
3. If installation will require the cables to be routed under a raised floor, check that the floor cutouts are in the correct positions.

Removing the Shipping Kit

1. Use a Phillips screwdriver on the right side door latches to turn each screw counterclockwise and release the latches.
2. Lift both latches up and turn them both counterclockwise to release them and open the right side door.
3. Open the installation kit and remove the door key for the tape library from the kit.
4. Open the right front door.
5. For each key slot in the left access door, insert the door key and turn it counterclockwise.
6. Open the left door.

Securing the Tape Library Position

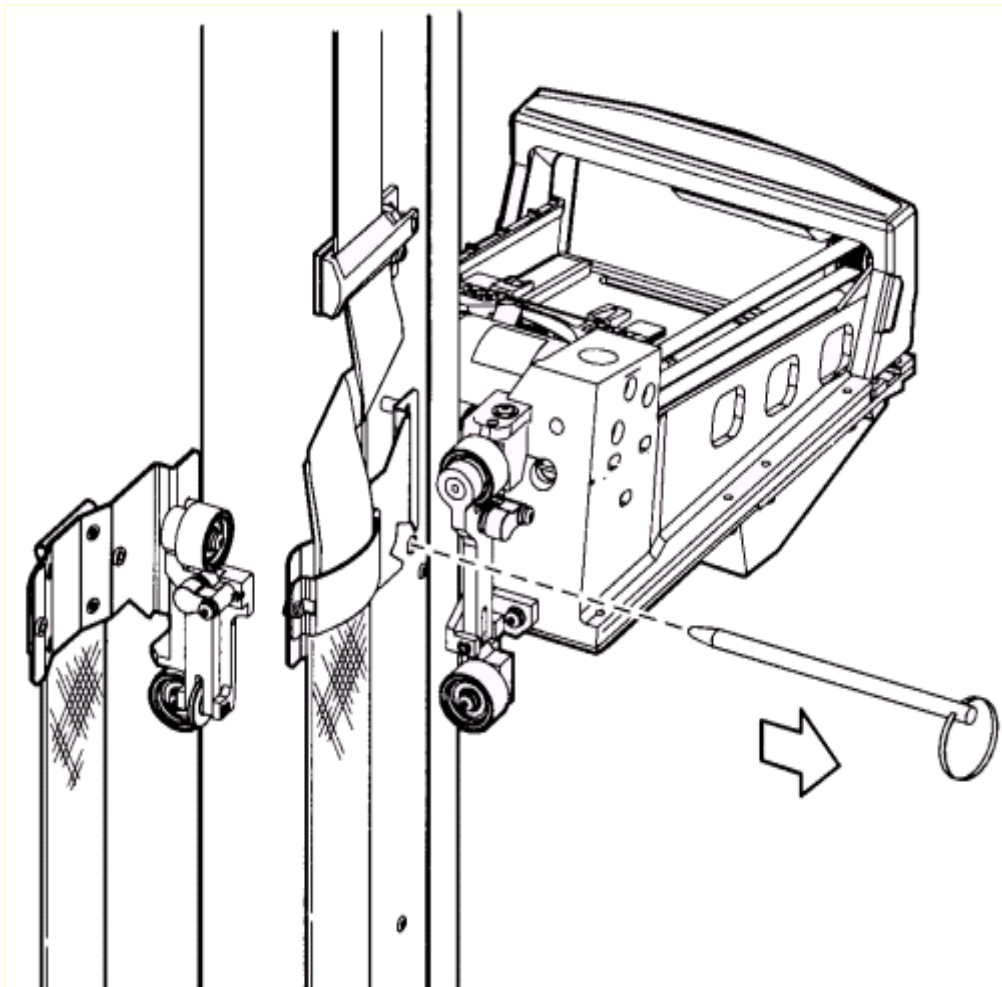
1. Apply the four wheel chocks from the shipping kit to the four wheels of the tape library.
2. Make sure the tape library does not move from its floor position.

Unpacking the Tape Library Interior

To unpack the interior portion of the tape library:

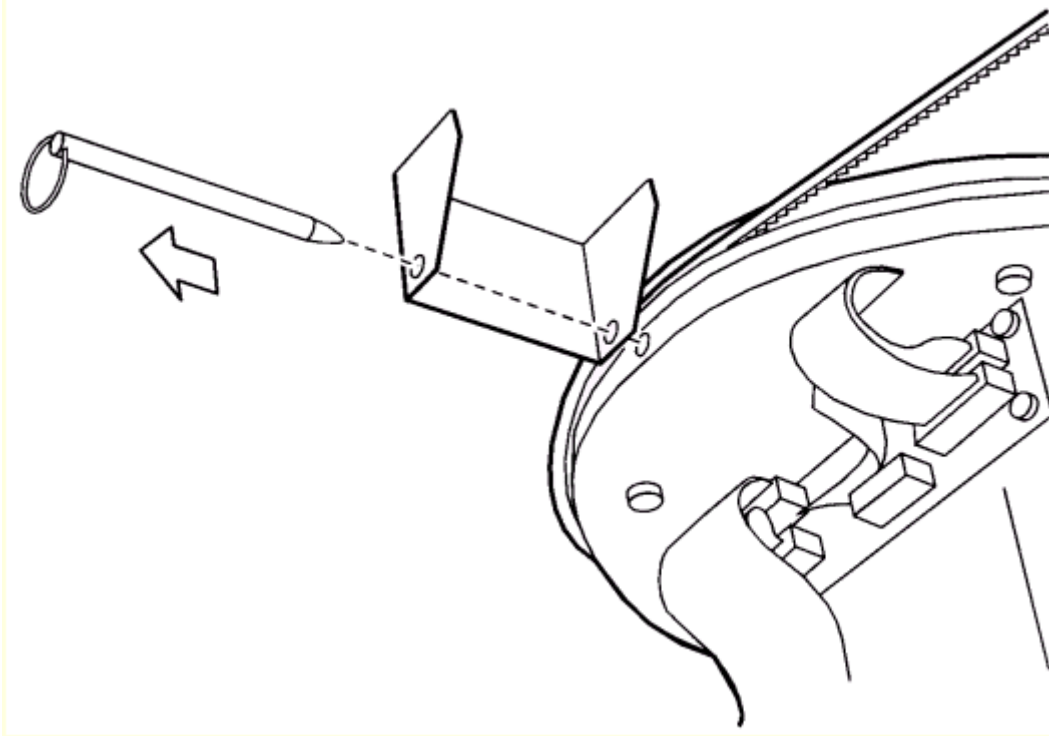
1. Locate and remove the Z column shipping pin.

Figure 2-4. Column Shipping Pin



2. Locate and remove the theta shipping pin.

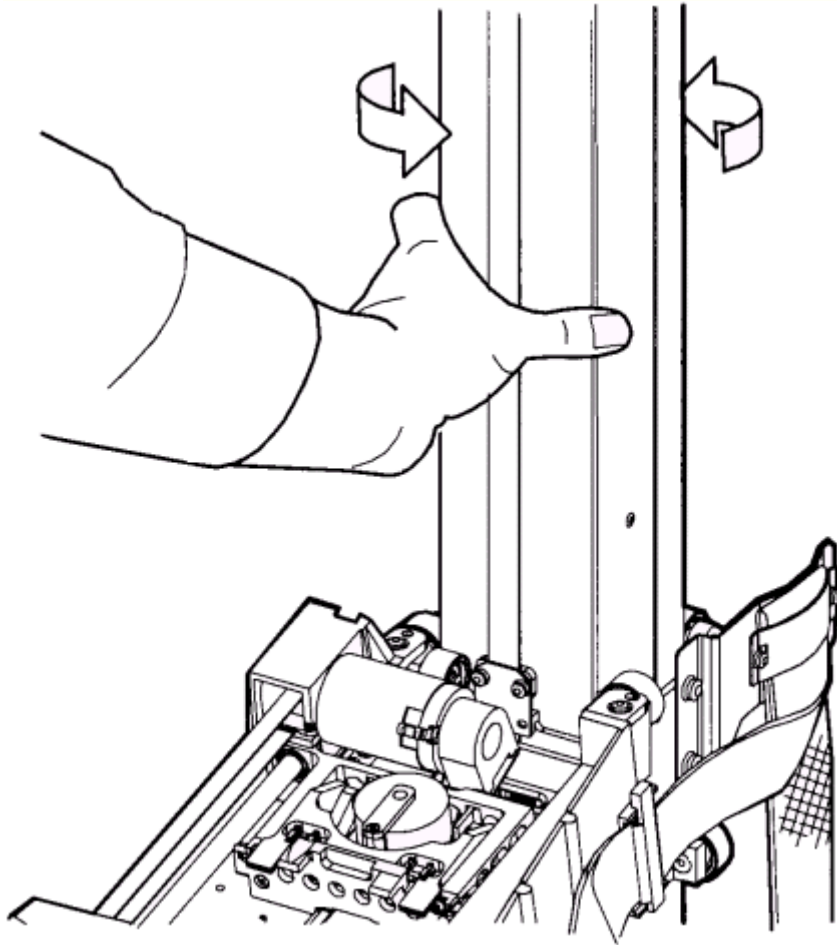
Figure 2-5. Theta Shipping Pin



3. Retain the shipping pins. You will need them for any maintenance procedures to the Z and theta motors. You can store them behind the right front door.
4. Move the Z column to access the hand assembly. See [Figure 2-6](#).

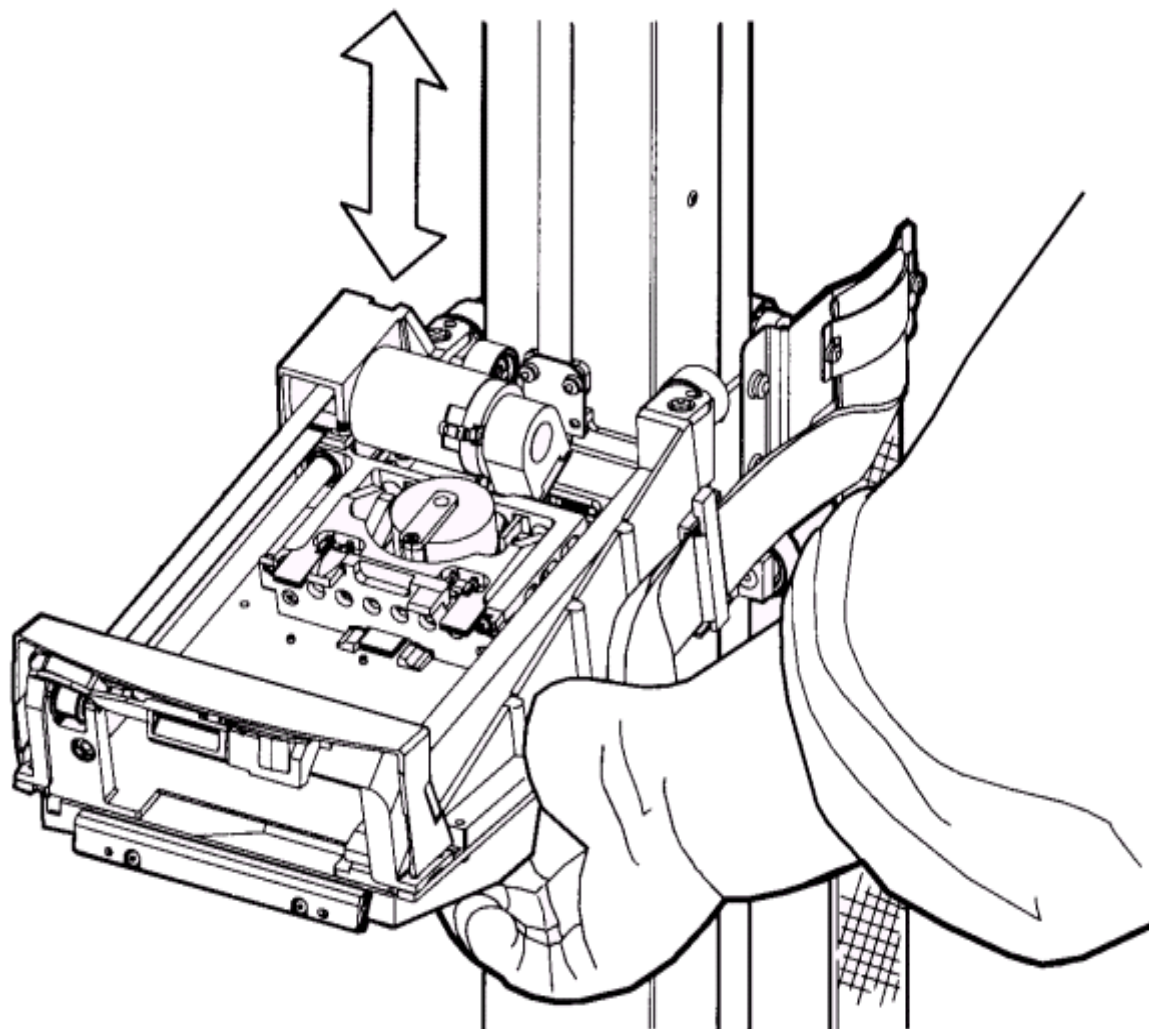
△ **Caution.** Move the Z column and the Z carriage at the two points shown in the following two figures. Excessive force will damage the hand assembly and its attaching hardware.

Figure 2-6. Z Column Movement



-
5. Raise the Z carriage assembly to waist level as shown in [Figure 2-7](#).
 6. Remove and discard the foam packing material from inside the assembly.
-

Note. Make sure the assembly is left in the fully retracted position.

Figure 2-7. Moving the Z Carriage Assembly

3

Installing the Tape Library

This section covers:

Installing the Expansion Frame	3-1
Tape Library Operating Options	3-6
Installing Cables	3-7
Connecting the Tape Library Power Cable	3-10
Terminate the SCSI Bus	3-12
After Installation is Complete	3-12

Installing the Expansion Frame

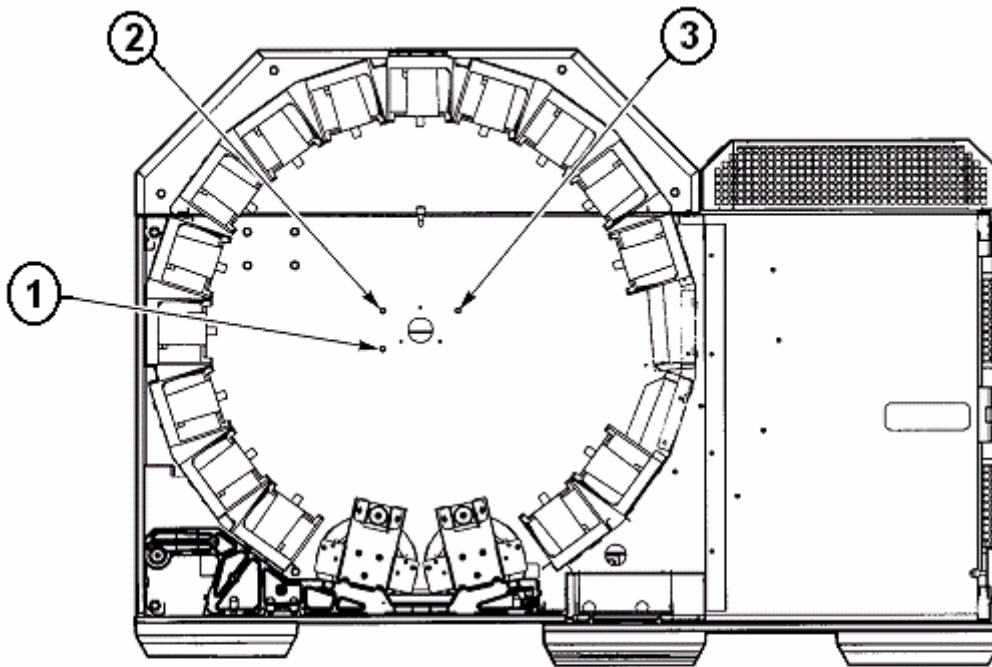
Follow these procedures to install an expansion frame for the tape library.

The tape library expansion frame adds 294 cartridge storage locations to the tape library. This installation procedure should take about two hours.

1. Use a flat blade screwdriver to remove any theta stops from positions 1 and/or 3. Refer to [Figure 3-1](#). Only one theta stop should remain—the theta stop in position 2 (full capacity).

Note. The tape library automatically configures for 1/3, 2/3, or full capacity when the it is powered on and the firmware is loaded. If the theta stops are not in the correct position, an error results.

-
- △ **Caution.** Two or more people are required to remove the expansion frame from its shipping package and install the expansion frame.
-

Figure 3-1. Theta Stops


Theta Stops

- 1. Stop number 1 and stop number 3 = 1/3 capacity**
- 2. Stop number 2 and stop number 3 = 2/3 capacity position; when stop number 2 is used alone, full capacity**
- 3. Stop number 3 is used for 1/3 and 2/3 capacity libraries only; removed for full capacity**

-
2. Using a Torx T-30 bit, remove the six mushroom attachments from the rear of the expansion frame by turning them counterclockwise.

△ **Caution.** Note the position of the theta lock bracket mounted on the top inside surface of the tape library. Be careful not to hit your head on the bracket.

3. Position the robotic hand at the top of the Z column and facing the tape drives.

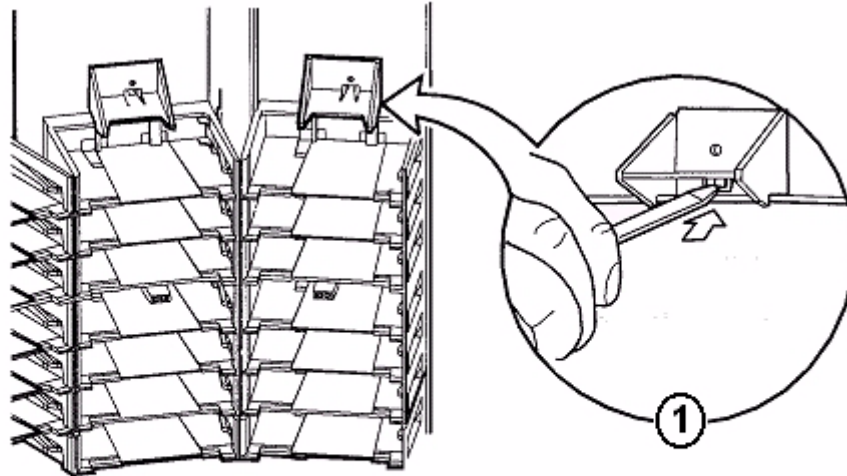
Decals on the tape library wall show panel and column locations. Viewed from the right rear of the tape library, locate the tape cartridge arrays at panel 2, column 4. These arrays must be removed to allow access to the mounting holes for the expansion frame.

- a. You might need a flashlight for this step. Refer to [Figure 3-2](#) and insert a flat blade screwdriver in the position shown.

- b. Gently pry up the array lock and pull back on the bottom of the assembly to remove it. Place the tape cartridge array lock aside.
 - c. Lift up and pull out the top tape cartridge array.
 - d. Continue removing the tape cartridge arrays until you have clear access to the mounting holes. Place all tape cartridge arrays clear of the work area.
4. Move the robotic hand to gain access to theta stop 3. Remove theta stop number 3.
5. If theta stop 1 is present, remove it also. Only theta stop 2 should remain.
6. Refer to [Figure 3-3](#) while unpacking the expansion frame and its attachment screws from the shipping package. Lay the expansion frame on its back.
7. Measure the distance from the floor of the room to the inside floor of the tape library.
8. Adjust the four leveling bolts on the expansion frame (measures from the inside floor of the expansion frame to the bottom of the leveling bolt) to approximate the distance measured in the previous step.

△ **Caution.** Be careful not to bend the leveling bolts in the next step.

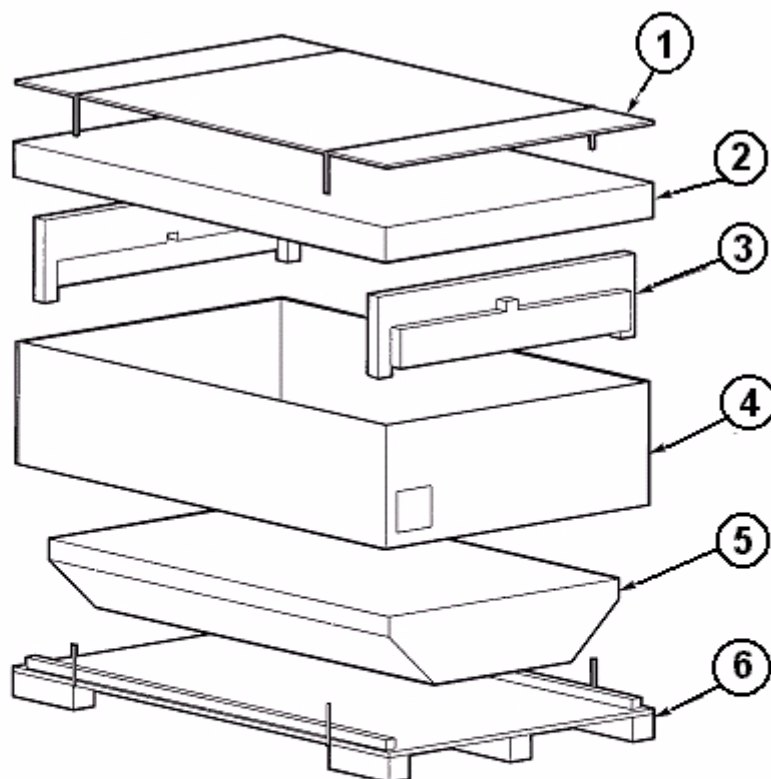
9. Raise the expansion frame and position it up against the opening of the tape library frame.
10. Refer to [Figure 3-4](#). Note the two alignment pins at the top and bottom of the frame. Move the frame close to the rear of the tape library.

Figure 3-2. Array Lock Removal and Replacement

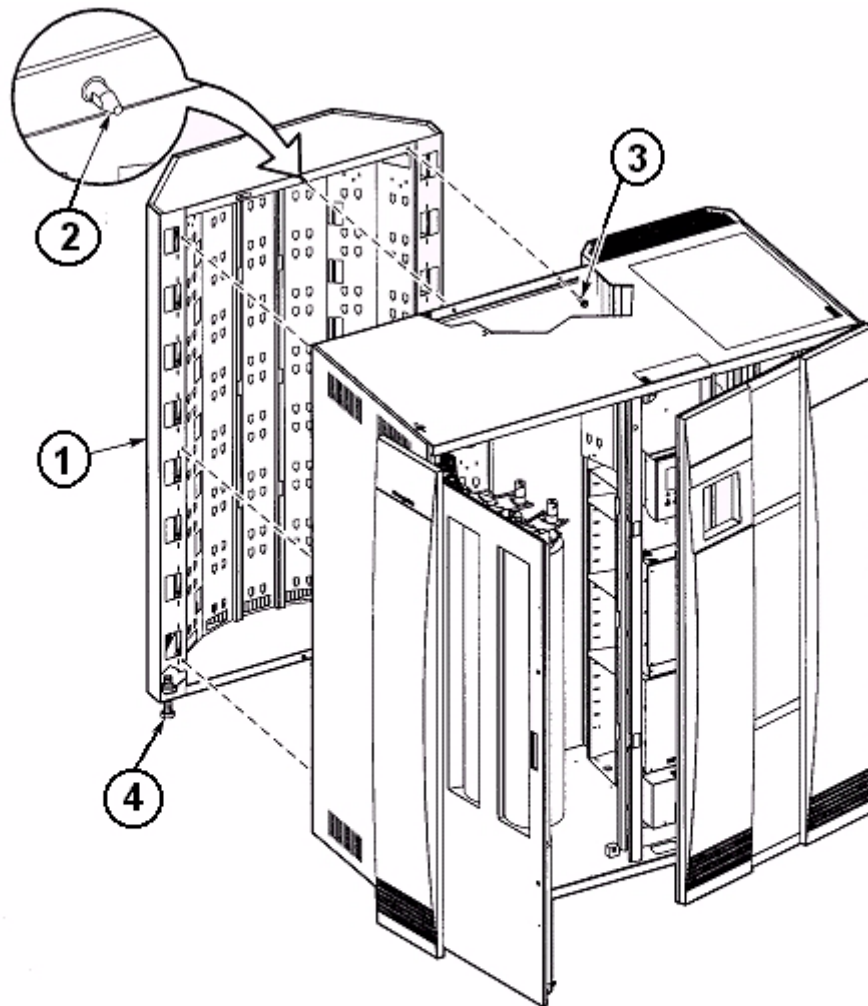
Array Lock Removal and Replacement

1. Insert screwdriver as shown

-
11. Using the adjustable wrench, adjust the legs of the expansion frame until the pins on the expansion frame align with the holes in the tape library wall:
 - a. Align the bottom pin on the expansion frame first.
 - b. Align the top pin on the expansion frame next.
 12. When aligned, push the expansion frame to mate with the alignment holes in the tape library wall.
 13. From the interior of the tape library, thread the six 1/4-20 by 1/4-inch screws (supplied in the expansion frame kit) through the tape library wall and into the expansion frame. Using a T-30 Torx driver, tighten the screws.
 14. Replace the tape cartridge arrays and tape cartridge array lock at Panel 2, Column 4.

Figure 3-3. Unpacking the Expansion Frame**Expansion Frame-Unpacking**

- 1. Plywood top**
- 2. Foam cover**
- 3. Side packing**
- 4. Cardboard frame**
- 5. Expansion door**
- 6. Pallet**

Figure 3-4. Attaching the Expansion Frame**Attaching the Expansion Frame**

- 1. Expansion frame**
- 2. Alignment pin**
- 3. Mounting screws**
- 4. Leveling bolt**

Tape Library Operating Options

The MPC controller card is factory-configured to:

- Supply terminating power
- Operate on a differential interface

Installing Cables

This section explains how to connect the following cables:

- Client-direct 1 tape library SCSI control cables
- Client SCSI data cables
- Ethernet cable
- Fiber cables

Note. If the cables are going under a raised floor, the floor tile under the tape library must have cutouts to allow routing of these cables.

SCSI Cable Paths

You have the option of separating the SCSI control and data paths. The control path transfers client commands for the tape library move operations only. The data path transfers data to and from the tape drives.

You can combine the data and control paths into one, single path. But consider performance when you determine the number of tape drives per SCSI path.

The SCSI control and data path cables must be 68-pin high density (HD) connectors at the tape library. You can use single-ended cables, but their connectors must be adapted to a 68-pin differential configuration at the tape library connection. Because a variety of system cables are available, the connector might need to be adapted to fit the tape library.

Refer to “[Appendix B, Multimode Fiber-Optic Cables](#)” for the SCSI cable part numbers.

SCSI Control Connection

Length requirements for the SCSI control connections depend on the position of the server in relation to the tape library.

Tape library control cables from the client or server connect to the MPC card through the two connectors at the front right bulkhead. These two connectors join into one connector at the MPC card. One bulkhead connector is for the SCSI in signals, and the other is for the SCSI “out” signals.

These instructions pertain to connections in general. For connection to a Sun SPARC5, refer to the next subsection.

Connecting to a Client or a Server Other Than Sun

▲ **WARNING.** The pass through terminator is installed inside a NonStop server.

To connect to the server or client SCSI control cable:

1. Bring the SCSI 68-pin cable from the server or client to the connectors on the right front bulkhead. Connect the SCSI server or client cable to one of the two connectors.
2. If the path continues from this point, connect a second cable to the second connector on the bulkhead. Route this cable through the hole in the tape library floor.
3. Continue routing the cable under the frame (toward the rear of the tape library) and up through the hole provided for the drive cables. Insert the cable into the first drive channel connector (at the bulkhead).
4. If the path terminates, connect a terminator at the other connector on the bulkhead.

Connecting to a Sun Microsystems Server

Connections to the Sun server are as follows:

Differential Operation

- The distance from the tape library to the Sun server can be up to 18 meters (60 feet.).
- The differential mode of operation allows the user to connect the drive SCSI paths to the same cable if desired.

The connection at the Sun server is 68-pin.

After the type of operation is determined, connect the Sun server using the procedure described in the paragraph above.

Note. When configuring the tape library to a UNIX workstation, a dedicated SCSI host bus adapter is recommended:

- For wide SCSI adapters, any target from 0 through 4 can be assigned for the tape library.
- For narrow SCSI adapters, the range of targets is 0 through 6.

To use the embedded system bus on the SPARC station, select target 6, 5, 2, or 0 for the tape library. The remaining targets are reserved for Sun peripherals.

For the IBM RISC System/6000, available targets on the embedded system bus are 6, 5, 3, and 2.

SCSI Drive Connections

For SCSI operations, check that the length restrictions are consistent with for the channel type being used.

Be sure to label each tape drive with its server or client address and to label the cables. These labels provide reliable identification for any future maintenance on the tape drives.

-
- △ **Caution.** Do not connect SCSI cables to the tape drives until they are configured for operation.
-

Direct Connection

For installations requiring SCSI direct data path configurations for each tape drive:

1. Open the left rear door.
2. Connect the client data cable for the first tape drive to the appropriate connector at the rear tape library frame.

Fiber Cables

Proper Fibre Channel components must be used. The components consist of a CT9800FC Fibre Channel converter, a short wave multimode GBIC, and multimode fiber cables. A GBIC connector must be used. The GBIC is mounted in the CT9800FC Fibre Channel converter, and it must be a black multimode GBIC.

For more information refer to [Appendix A, Connecting the Fibre Channel Components for the CTL700 Tape Library](#).

For part numbers and descriptions for the fiber cables using the short wave GBICs, refer to [Appendix B, Multimode Fiber-Optic Cables](#).

Connecting the Tape Library Power Cable

This section describes the procedure to connect the tape library power cable. If the tape library has the duplicate power supply feature, be sure that each power supply is connected to its own circuit breaker.

▲ **WARNING.** To avoid injury, do not connect the power cable until indicated in the instructions. Be sure the circuit breakers on the tape library power supply and for the power outlet are turned off.

Routing the Power Cable

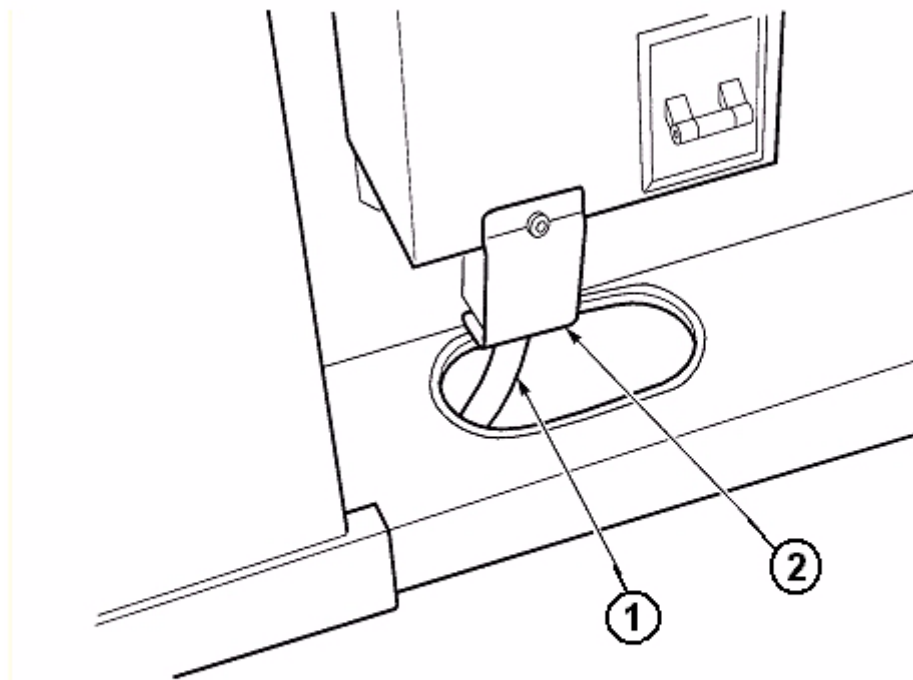
To route the power cable:

1. Check that the tape library circuit breaker is in the down (OFF) position.
2. Use a 5/16-inch nut driver (or to remove the Torx bit from your driver) to remove the nut that holds the cable strain relief plate in place. Place the strain relief plate to the side.
3. Insert the female connector through the hole in the tape library floor. Be sure the power cable is labeled with your circuit breaker number and location.

Note. If your installation requires this cable to be under the floor, carefully pull the cable up through the hole in the floor.

4. Insert the power cable connector into the bottom of the AC power distribution unit.
5. Obtain the strain relief bracket and nut, and attach the strain relief bracket.

Note. Safety agency standards require that the power receptacle be located within 2.8 meters (9.2 feet.) of the tape library. The power receptacle must also be easily accessible. In sites where the power cable is directly wired to a power source, your facility must have a readily accessible disconnect device incorporated in the fixed wiring.

Figure 3-5. Tape Library Power Cable**Library Power Cable**

- 1. Power cable**
- 2. Strain relief**

Connecting Power

To connect the tape library power cable to its power source:

1. Check that the power cable is labeled with the tape library address or location.
2. Connect the male end of the power cable into the wall outlet.
3. Turn the circuit breaker for the wall outlet to ON.
4. Lift the tape library circuit breaker up (ON).
5. The tape library begins its initial program loading of the embedded firmware.

Terminate the SCSI Bus

[Table 3-1](#) tells when and where to add a terminator to the SCSI bus.

Table 3-1. Terminate the SCSI BUS

If the tape drive is...	Then...
The last or only tape drive on the SCSI bus	<ol style="list-style-type: none"> 1. Connect the SCSI terminator to one of the SCSI signal connectors on the tape library patch panel. 2. Snap the wire cable clamps into place to secure the terminator.
Not the last or only tape drive on the SCSI bus	Install the terminator at the end of the SCSI bus or on the second tape drive.

Note. The SCSI bus must be terminated at the last SCSI device.

▲ **WARNING.** The pass through terminator must not be used on the S74 or IOMF2; this could cause problems. Use the pass-through terminator on PMF1, PMF2, and IOMF1. But not on PMF3 and IOMF2.

After Installation is Complete

After unpacking the tape library, installing the tape drives, connecting the power cables, and performing the IPL:

- For an overview of the controls and indicators on the CTL700 tape library, refer to [Section 4, Controls and Indicators on the CTL700 Tape Library](#).
- To configure the tape library refer to [Section 5, Configuring and Testing the Tape Library](#).
- To operate the tape library from the operator panel, refer to [Section 6, Operating the Tape Library](#).
- To configure the tape drive using SCF, refer to [Section 8, Configuring the CTL700 Tape Library for the NonStop S-Series Server](#).
- For information on using SCF, BACKUP, and RESTORE with the tape drive, refer to [Section 9, Managing Tape Drives](#).

4

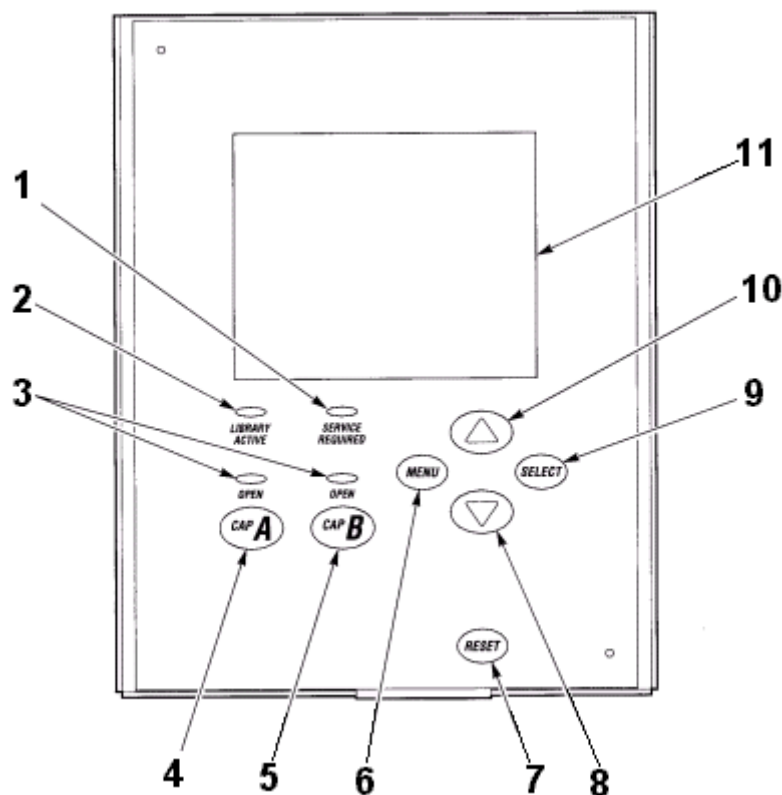
Controls and Indicators on the CTL700 Tape Library

This section covers:

Operator Panel	4-1
Tape Library Power Switch	4-13
Tape Drive Power Switches	4-15

Operator Panel

The operator panel, recessed into the tape library's rack door, contains buttons, indicators, and a graphic display. [Figure 4-1](#) shows the panel.

Figure 4-1. Operator Panel Display, Control, and Indicators


1. *Service Required* indicator is steadily red when human intervention is required.
 2. *Library Active* indicator flashes green when the library is operational.
 3. *Open* indicator is steadily amber when the CAP is open for you to enter or remove cartridges.
 4. **CAP A** open button rotates CAP A for you to access the magazines.
 5. **CAP B** open button rotates CAP B for you to access the magazines.
 6. **MENU** button initially places you into the Main Menu screen; subsequently, it returns you to a previously selected screen.
 7. **RESET** button starts an IPL.
 8. Arrow down button moves the cursor down the display screen; it also decrements a value underscored to the next field.
 9. **SELECT** button selects an item on a menu; it also saves the currently underscored value and moves the cursor to the next field.
 10. Arrow up button moves the cursor up the display screen; it also increments a value underscored on the screen.
 11. Graphic display screen shows current information and errors and allows input from menus.
-

Use this panel to:

- Monitor current information about the CAPs, configuration, drives, doors, tape drive cleaning, hardware and software versions, and tape library status
- Help resolve tape library problems

If an error occurs, the display shows a fault symptom code (FSC), which can be given to a systems delivery engineer (SDE) or to the local service provider to help resolve problems. Write down the FSC as soon as it appears.

- Set tape library, network, and drive configurations
- Manipulate CAPs
- Replace the tape drive cleaning cartridges and set the cleaning cartridge usage
- Run tape library and tape drive tests
- Reset by starting an initial program load (IPL) on the tape library

For specific task instructions refer to [Section 5, Configuring and Testing the Tape Library](#) and [Section 6, Operating the Tape Library](#).

Indicators

Three indicators on the operator panel provide basic status information: Library Active, Service Required, and Open. For the location and description of each button, refer to [Figure 4-1](#) on page 4-2.

Buttons

Six buttons appear on the operator panel: CAP, RESET, MENU, SELECT, and the up and down arrows. CAP and RESET let you directly manipulate the tape library. The remaining four buttons let you manipulate the menus and underscored values on the graphic display. For the location and description of each button, refer to [Figure 4-1](#) on page 4-2.

Display Screens

Screens on the graphic display show current information and allow input.

Information accessible on the screens includes tape drive status, CAP status, tape library capacity and features, hardware and software versions, SCSI type, cleaning cartridge and Auto Clean status, and error and FSC information.

Except for the CAP status and error and FSC information, these values are set through an automatic configuration process that occurs during an IPL.

Other values require user input. These values include:

- Cleaning cartridge usage threshold
- Drive configuration: SCSI ID and bus status (on or off bus)
- Network configuration values: tape library name, IP address
- Tape library configuration values: SCSI ID, Fast Load enable/disable, date, time
- Display brightness and contrast

In addition, the display screens must be used to:

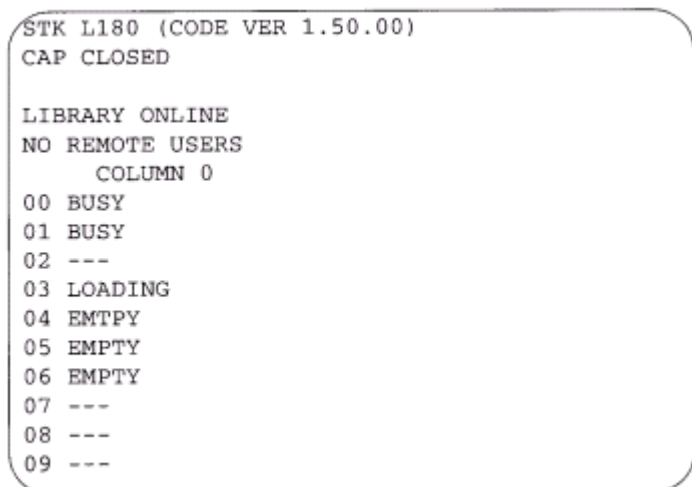
- Export cleaning cartridges through the CAPs
- Run diagnostic tests

The next subsections describe the tape library's main screens.

Tape Library Status

The Library Status screen is an information-only screen. It is the first screen to appear on the operator panel after an IPL. The screen displays the status of the CAPs, the activity of the tape library, and the status of the installed tape drives. [Figure 4-2](#) shows an example of the Library Status screen.

Figure 4-2. Library Status Screen



```
STK L180 (CODE VER 1.50.00)
CAP CLOSED

LIBRARY ONLINE
NO REMOTE USERS
  COLUMN 0
00 BUSY
01 BUSY
02 ---
03 LOADING
04 EMTPY
05 EMTPY
06 EMTPY
07 ---
08 ---
09 ---
```

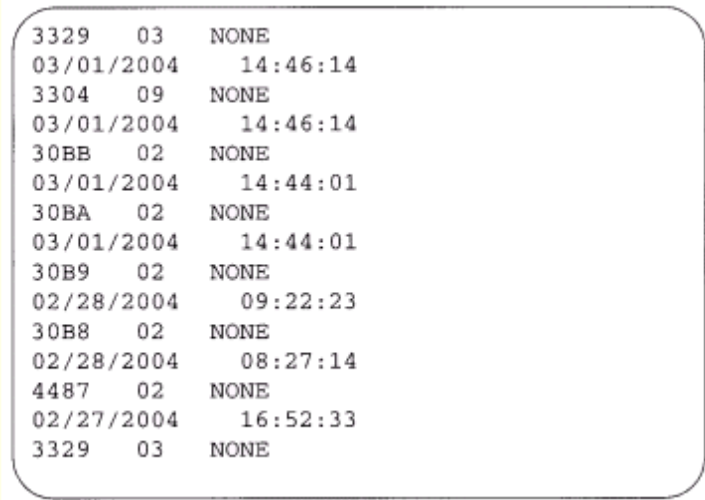
Push the Menu button from the Library Status screen to access the Main menu.

FSC Logs

Accessible from the Main menu, the FSC Logs screen displays all fault symptom codes (FSCs), the number of occurrences, and the date and time of the last occurrence. You can scroll through to display the last 20 events. [Figure 4-3](#) shows an example of the FSC Logs screen.

Note. These statements apply to the Event Log screen:

1. Events listed in the event log might be failures. All events are recorded.
 2. FSCs are generated for both tape library and drive errors.
-

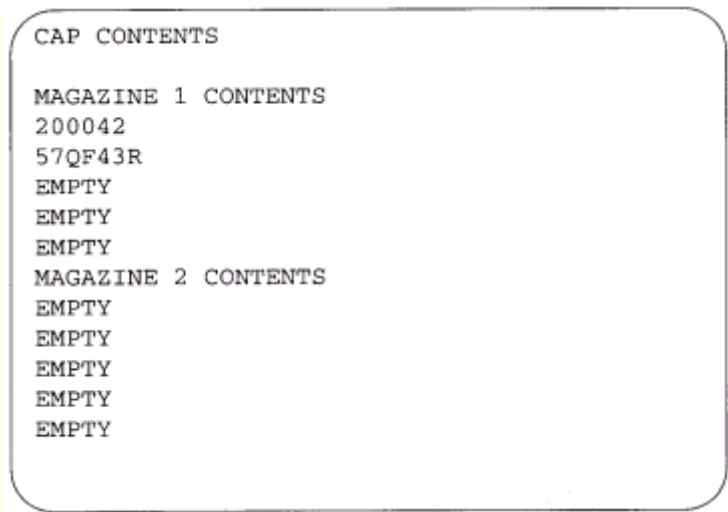
Figure 4-3. FSC Log ScreenA screenshot of the FSC Log Screen showing a list of log entries. Each entry consists of a four-digit ID, a two-digit number, and the word 'NONE'. Some entries also include a date and time. The entries are: 3329 03 NONE, 03/01/2004 14:46:14, 3304 09 NONE, 03/01/2004 14:46:14, 30BB 02 NONE, 03/01/2004 14:44:01, 30BA 02 NONE, 03/01/2004 14:44:01, 30B9 02 NONE, 02/28/2004 09:22:23, 30B8 02 NONE, 02/28/2004 08:27:14, 4487 02 NONE, 02/27/2004 16:52:33, and 3329 03 NONE.

```
3329 03 NONE
03/01/2004 14:46:14
3304 09 NONE
03/01/2004 14:46:14
30BB 02 NONE
03/01/2004 14:44:01
30BA 02 NONE
03/01/2004 14:44:01
30B9 02 NONE
02/28/2004 09:22:23
30B8 02 NONE
02/28/2004 08:27:14
4487 02 NONE
02/27/2004 16:52:33
3329 03 NONE
```

CAP Status

Accessible from the Main menu, the CAP Status screen is an information-only screen. It displays either the VOLSER of a cartridge or a status message for each slot in a CAP magazine. [Figure 4-4](#) shows the CAP status screen.

Note. Scroll down to view the contents of both CAPs.

Figure 4-4. CAP Status ScreenA screenshot of the CAP Status Screen. It displays the title 'CAP CONTENTS' at the top. Below it, it shows 'MAGAZINE 1 CONTENTS' followed by the VOLSER '200042' and '57QF43R', and three 'EMPTY' status messages. Then it shows 'MAGAZINE 2 CONTENTS' followed by four 'EMPTY' status messages.

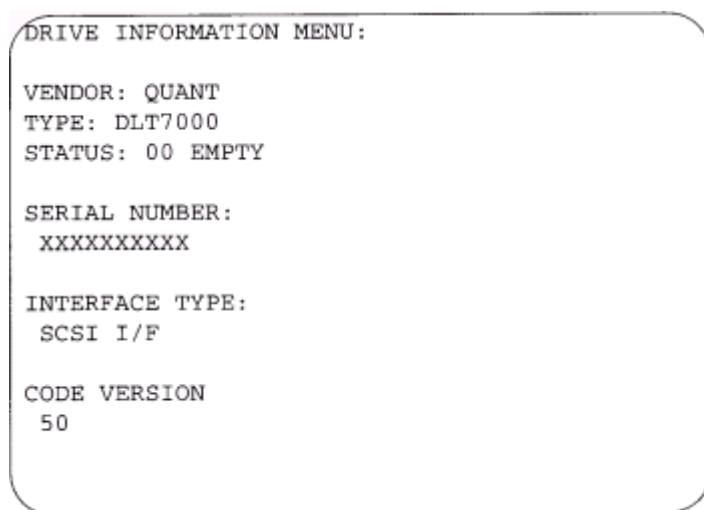
```
CAP CONTENTS

MAGAZINE 1 CONTENTS
200042
57QF43R
EMPTY
EMPTY
EMPTY
MAGAZINE 2 CONTENTS
EMPTY
EMPTY
EMPTY
EMPTY
EMPTY
```

Drive Information

Accessible from the Main menu, the Drive Information menu is an information-only screen that lists manufacturing and status information about the selected drive. (See [Figure 4-5.](#))

Figure 4-5. Drive Information Menu



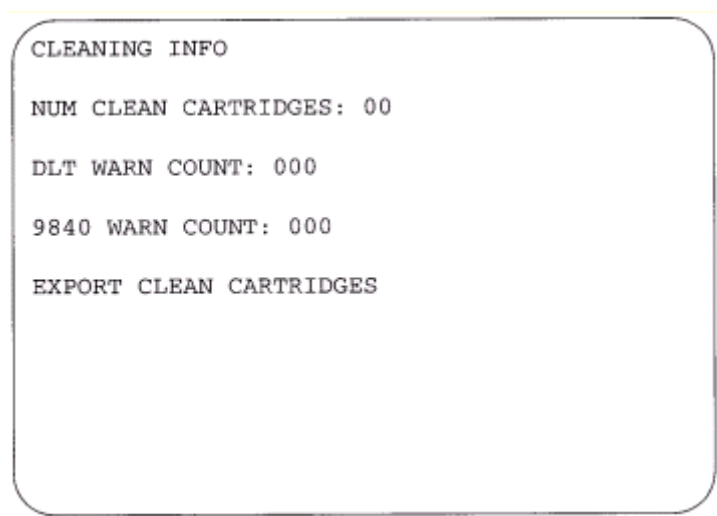
Vendor	The manufacturer of the tape drive
Type	The tape drive model
Status	The tape drive's local number and status
Serial Number	The serial number assigned by the tape drive's manufacturer
Interface Type	The type of client to drive interface (This example shows a SCSI interface.)
Code Version	The firmware version of the tape drive

Cleaning Information

Accessible from the Main menu, the Cleaning Info menu provides information about cleaning and controls the tape library’s cleaning cartridges. It enables you to change the warning count for each type of cleaning cartridge. [Figure 4-6](#) shows an example of the Cleaning Info menu.

The Cleaning Info menu enables you to change the warning count for each type of cleaning cartridge. The menu also lets you check the number of times a cleaning cartridge has been used.

Figure 4-6. Cleaning Information Menu



Num Clean Cartridges	The total number of cleaning cartridges mounted in the reserved cells within the tape library
5259 Warn Count	Not currently applicable
9840 Warn Count	The number of times you want the tape cleaning cartridge to be used before the tape library ejects it
Export Clean Cartridges	A procedure for using the CAP to remove cleaning cartridges from the reserved cells

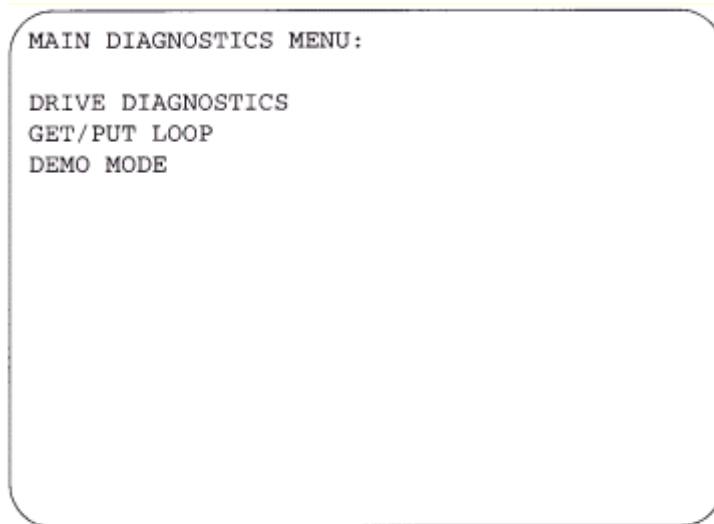
Diagnostics Tests

Accessible from the Main menu, the Main Diagnostics menu lets you perform these tests:

- Tape drive-related tests:
 - Clean Drive: Lets you clean the tape drives.
 - Mount: Loads test tape cartridges from a tape drive.
 - Dismount: Unloads test tape cartridges from a tape drive.
 - Mount-Dismount Loop: Loads and unloads test tape cartridges from a tape drive. You can designate the number of times the tape library goes through the loop.
- Get-put loop: Gets a diagnostics tape cartridge and returns it to the same location. The user can designate the number of times the tape library goes through the loop.
- Demo mode: Simulates tape library operation.

Note. All diagnostics tests except Clean Drive require the tape library and associated tape drive to be offline.

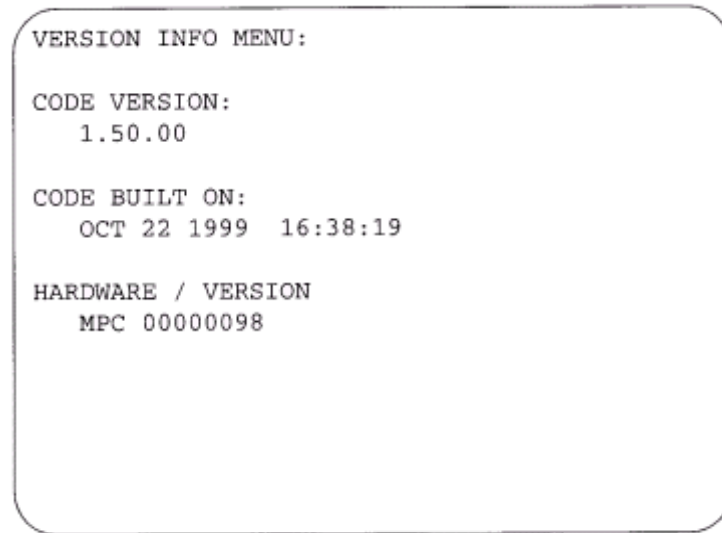
Figure 4-7. Main Diagnostics Menu



Version Information

Accessible from the Main Menu, the Version Info menu is an information-only screen. See the example in [Figure 4-8](#). It displays the version level of the library's functional code, the date and time the code was completed, and the serial number of the logic card (also referred to as the MPC card).

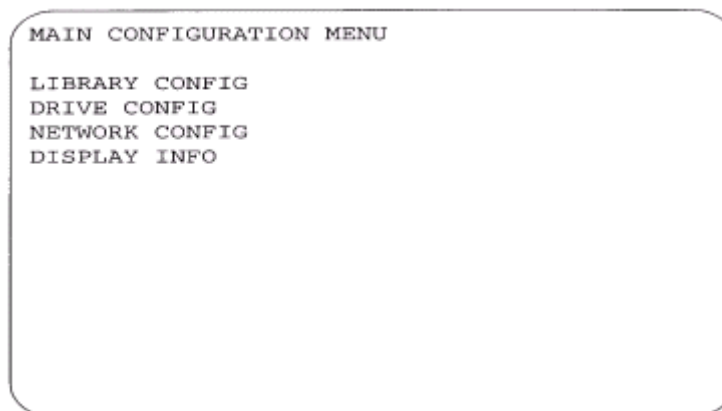
Figure 4-8. Version Info Menu



Configuration Menu

Accessible from the Main menu, the Configuration menu (See [Figure 4-9](#)) routes you to the configuration menus (library, drive, and network) and to the panel display controls.

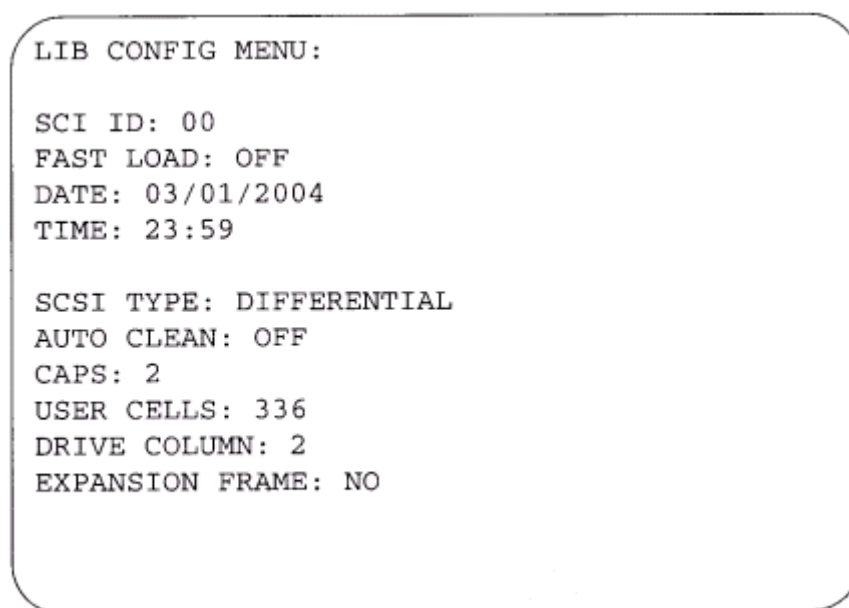
Figure 4-9. Configuration Menu



Library Configuration

Accessible from the Main Configuration menu, the Library Config menu displays library capacity information and lets you modify the library's configuration. [Figure 4-10](#) shows an example of a library configuration screen.

Figure 4-10. Library Configuration Menu



This screen lets you set the following:

SCSI ID	Tape library's SCSI identification number
Fast Load	Fast Load feature on or off
Date	Current date
Time	Current time
SCSI Type	Type of SCSI bus that connects the tape library to the server
Auto Clean	Whether Auto Clean is enabled
CAPs	Number of CAPs installed
User Cells	Number of data storage cells the library contains
Drive Column	Number of tape drive columns installed
Expansion Frame	Whether an expansion frame is installed

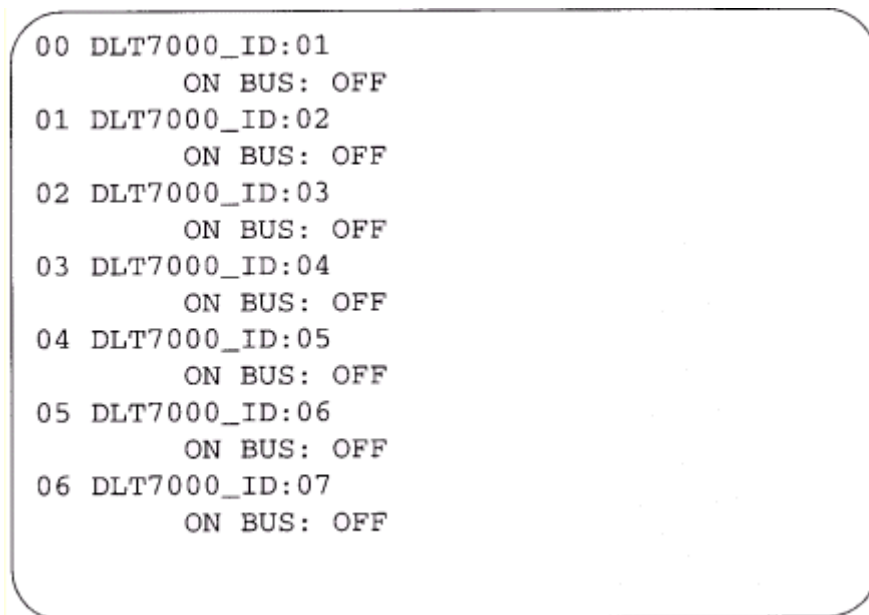
Drive Configuration

Accessible from the Main Configuration menu, the drive configuration menu lets you modify portions of each drive's configuration. [Figure 4-11](#) shows an example screen. For each drive, the menu displays the drive position, drive type, SCSI ID and indicates whether the drive is on the same SCSI bus as the library.

The panel displays only 16 lines per screen. If the library contains more than eight drives, use the down arrow button to scroll to drive 09 and higher. For more information, see [Entering Tape Drive Information](#) on page 5-9.

Note. The cursor position is saved on all screens that list the tape library's tape drives.

Figure 4-11. Drive Configuration Menu

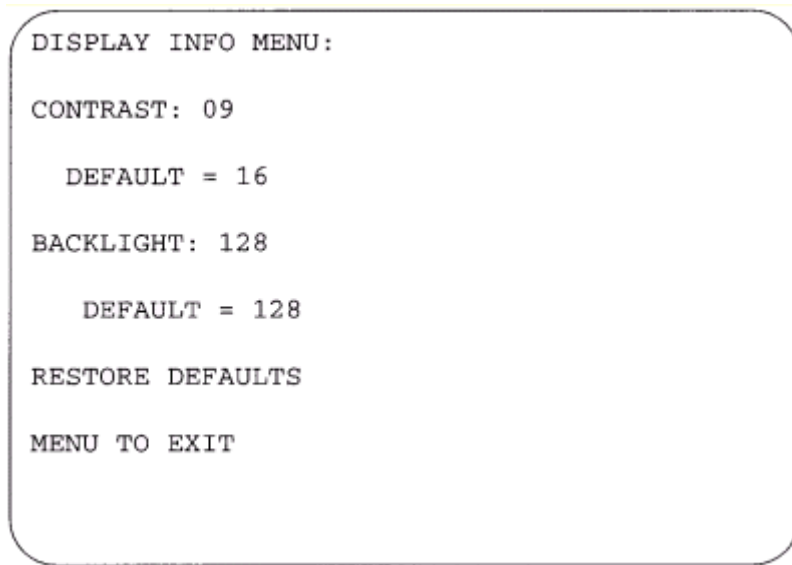


```
00 DLT7000_ID:01
      ON BUS: OFF
01 DLT7000_ID:02
      ON BUS: OFF
02 DLT7000_ID:03
      ON BUS: OFF
03 DLT7000_ID:04
      ON BUS: OFF
04 DLT7000_ID:05
      ON BUS: OFF
05 DLT7000_ID:06
      ON BUS: OFF
06 DLT7000_ID:07
      ON BUS: OFF
```

Display Information

Accessible from the Main Configuration menu, the Display Information menu (See [Figure 4-12](#)) leads to menus that let you adjust the contrast and backlight on the graphic display screen. For more information, see [Setting Screen Characteristics](#) on page 5-7.

Figure 4-12. Display Information Menu



Operations Overview

You can perform these tasks through the operator panel menus:

- FSC Logs
- CAP Status
- Cleaning Info
- Diagnostics
- Version Info.
- Configuration

Tape Library Power Switch

The tape library power switch is a circuit breaker or breakers behind the right front door of the tape library. [Figure 4-13](#) shows the power switch location. This switch, attached to the AC power distribution unit (PDU), controls the AC power to the tape library and tape drive column.

The power switch has two configurations:

- A single breaker on the AC power distribution unit controls the tape library and a single tape drive column.
- An optional second breaker, located on the second power distribution unit power and the second drive column, and an optional second library power supply.

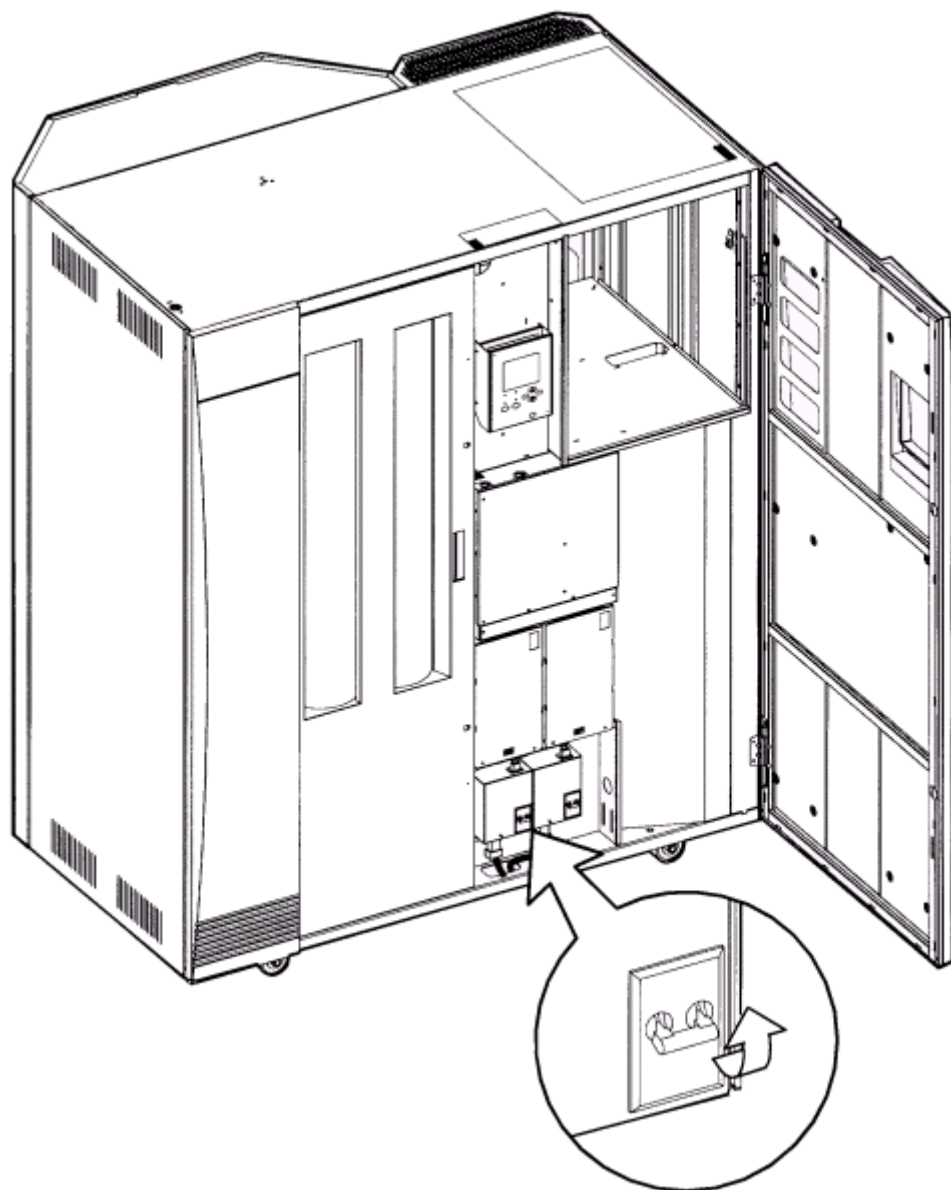
Note.

1. For this configuration, the second breaker must be connected to a separate electrical circuit.
 2. If only one breaker is powered off, the second breaker, if installed, will still be powered on.
-

To apply power to the library and drive column, lift the switch or switches.

To remove power from the library and drive column:

1. Make sure all jobs are complete.
2. Push down on the library power switch or switches.

Figure 4-13. Library Power Switch Location

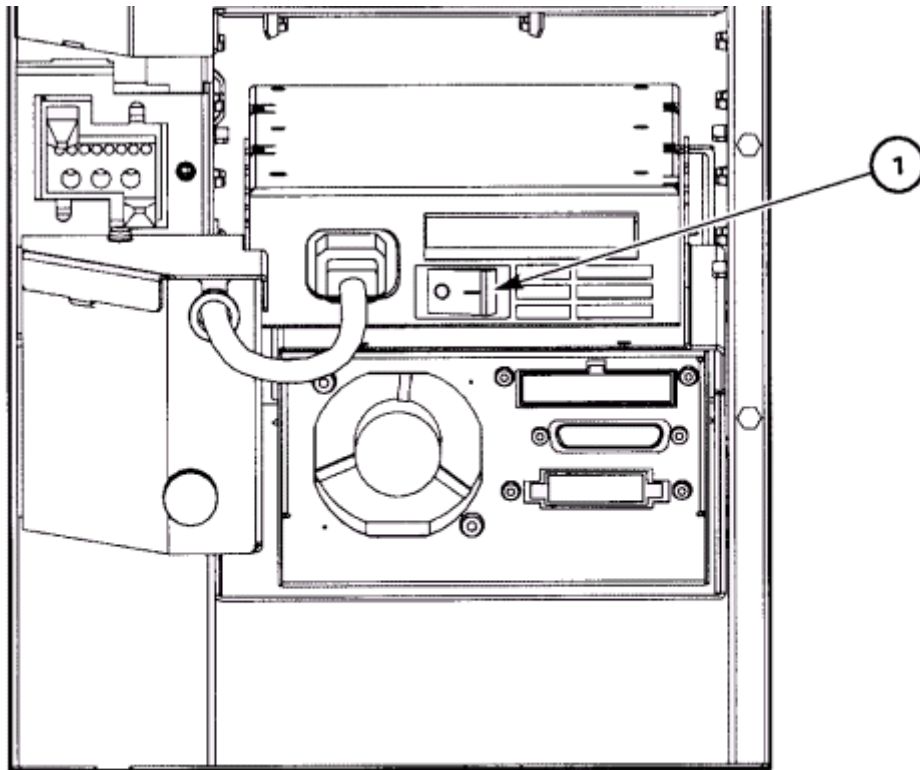
Tape Drive Power Switches

The tape drives are behind the tape drive access door inside the right side door of the library. Each drive has a power switch that controls the supply of power to that drive only. [Figure 4-14](#) shows a tape drive's power switch location.

To remove power from a tape drive, turn the drive switch to the 0 position.

To supply power to a tape drive, turn the drive switch to the 1 position.

Figure 4-14. Tape Drive Power Switch Location



Tape Drive Power Switch Components

1. Tape drive power switch

5 Configuring and Testing the Tape Library

This section covers the following topics:

Overview of Configuration	5-1
Tape Library Capacity	5-1
Entering Configuration Data	5-3
Performing the Final Steps	5-11
Initialization Sequence	5-11
Testing the Tape Library	5-14

Overview of Configuration

This section describes how to configure and test the tape library and its associated tape drives for operation. When the tape library is powered-on, it performs the initialization of the robotic components.

Tape library firmware is factory-installed on all new tape libraries. It resides within a Flash PROM chip on the MPC controller card. The tape library and tape drives must be configured to enable full initialization, audit, testing, and online capabilities.

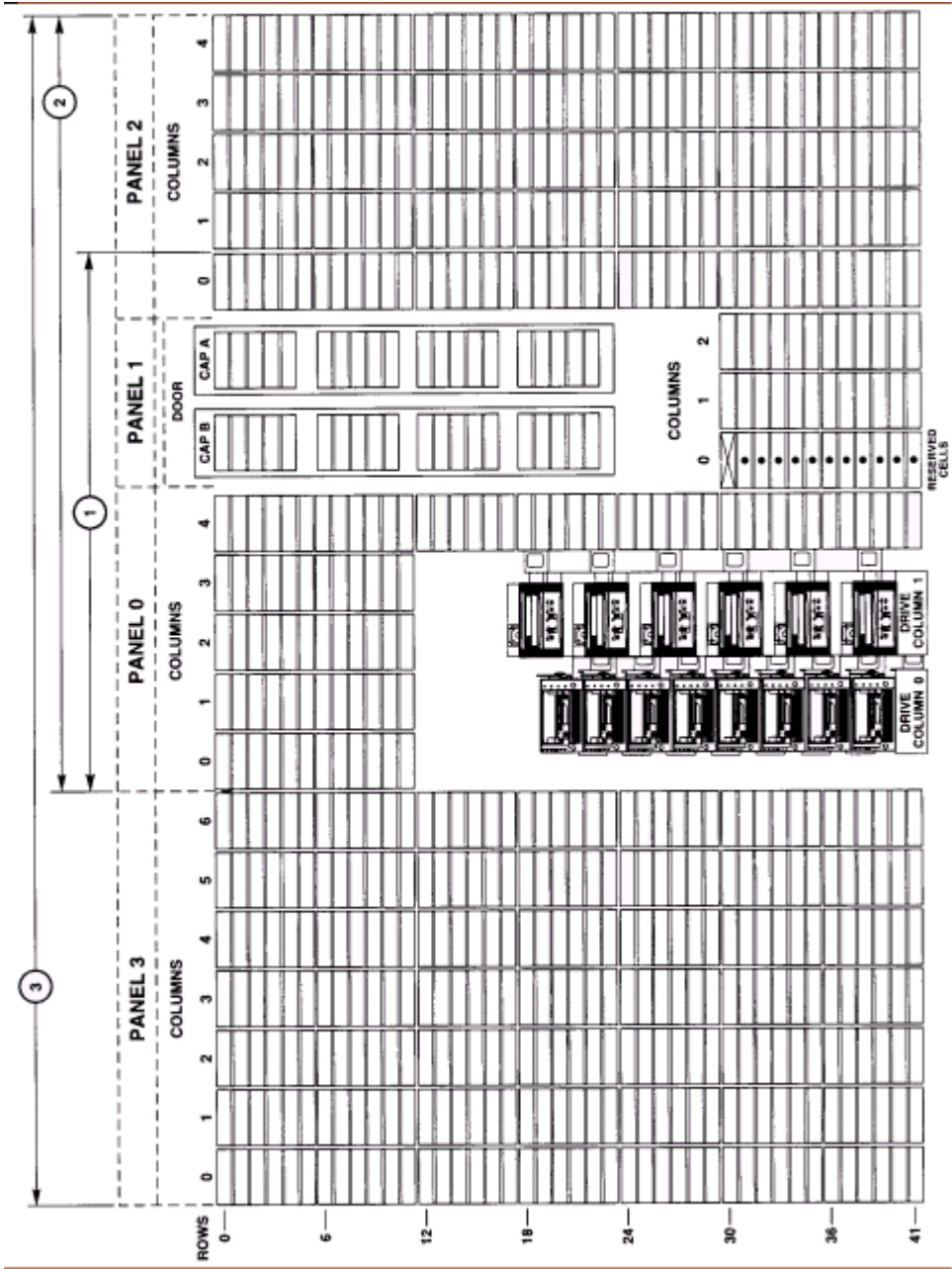
Tape Library Capacity

The two capacity variations available for the CTL700 are listed below:

Model	Capacity
CTL700	156 cells
CTL700M	618 cells
CTLUPG	462 cell upgrade

Note. The capacity of the tape library is automatically configured during Initial Program Load (IPL). The firmware configures the size of the tape library based on the positions of the theta stops.

Figure 5-1. Tape Library Capacity Map - Two Tape Drive Columns



Entering Configuration Data

Use the tape library operator panel to enter your configuration data.

Using the Operator Panel

The operator panel function buttons are as follows. For an illustration of the operator panel, refer to [Figure 4-1, Operator Panel Display, Control, and Indicators](#), on page 4-2. The buttons used for configuration are:

- Up arrow - to move the cursor up or scroll up
- Down arrow - to move the cursor down or scroll down
- SELECT - to select a menu item
- MENU:
 - To initially open the Main Menu screen
 - To return to a previously selected screen

Providing Configuration Information

1. Before starting the configuration procedure, read the explanations in “[Entering Tape Drive Information](#)” on page 5-9.”
2. Determine the choices.
3. Write down your tape library configuration information.
4. Write down your tape drive configuration.

You might need to consult the system administrator for some information.

△ **Caution.** Check that the tape library and associated tape drives are offline to the system.

Table 5-1. Tape Library Configuration Selection

Option	Selection
IP address*	
Subnet mask*	
Tape library name*	
Tape library capacity	Automatically configured at IPL
SCSI ID (tape library)	
Date/time	

Table 5-1. Tape Library Configuration Selection

Option	Selection
Fast load enabled or disabled	Automatically configured as enabled if cleaning cartridges are installed in the reserved cells.
Cleaning cartridge life	

Table 5-2. Tape Drive Configuration Form

Tape Drive #	SCSI ID	ON or Off Bus	Tape Drive #	SCSI ID	On or Off Bus

Tape Library Configuration

The TAPE LIBRARY CONFIGURATION screen allows you to set:

- Tape library SCSI ID (IPL of tape library required)
- Drive fast load on or off
- Date
- Time
- Operator panel screen characteristics
- Drive SCSI IDs

Note. The configuration information in the lower half of the TAPE LIBRARY CONFIG screen is automatically set when the tape library performs its initialization process. This data cannot be changed from the operator panel. This information includes:

- SCSI type
 - Auto Clean
 - Number of CAPs
 - User cells
 - Number of tape drive columns available
 - Expansion frame information
-

Entries that you must enter manually are discussed in the next subsections. The sequence assumes that all entries are being made at one time. To change only one entry (for example, the tape library SCSI ID), follow the instructions on the screen.

Setting the SCSI ID for the Tape Library

Complete the following steps to enter the SCSI identifier (ID) for the tape library. The SCSI ID for the tape library is usually set to 0.

SCSI IDs for tape drives appear on a different screen.

Note. When configuring the tape library for a Unix workstation, It is recommended that a dedicated SCSI host bus adapter be used:

- For wide SCSI adapters, any target from 0 through 14 can be assigned for the tape library.
- For narrow SCSI adapters, the range of targets is 0 through 6.

If you choose to use the embedded system bus on the SPARC station, select target 6, 5, 2, or 0 for the tape library. The remaining targets are reserved for Sun peripherals.

The tape library SCSI ID is set from the LIBRARY CONFIG screen. To set this value:

1. From the online status screen, press the **MENU** button. The next menu displays these options:
 - EVENT LOG
 - CAP CONTENTS
 - CLEANING INFO
 - DIAGNOSTICS
 - VERSION INFO
 - CONFIGURATION
2. Press the down arrow button to select CONFIGURATION.
3. Press **SELECT**. The main configuration screen appears.

4. Line up the cursor with LIBRARY CONFIG and press the **SELECT** button.
5. Line up the cursor with SCSI ID and press the **SELECT** button.
6. An editing screen appears.
7. Follow the instructions on the screen to change the SCSI ID.
8. When the SCSI ID is correct, press the **SELECT** button to save the changes. To abort, press the **MENU** button.
9. Entry of the tape library SCSI ID requires an IPL of the tape library. If you are setting this value only, press the **RESET** button. If you are setting other values, continue with the next subsection.

Note. A change in the tape library SCSI ID requires an IPL of the tape library.

Fast Load Enabled or Disabled

The two terms are defined as:

Fast Load Enabled The robot mounts a tape cartridge to a tape drive and then immediately reports the move complete.

Fast Load Disabled The robot mounts a tape cartridge to a tape drive and waits at the drive location until the tape cartridge is fully loaded before reporting the move completed.

Note. Some host software does not support the Fast Load Enabled option. Check before setting the fast load option.

To enable or disable the Fast Load feature from the LIBRARY CONFIG screen:

1. Line up the cursor with FAST LOAD.
2. Press the **SELECT** button. An editing screen appears.
3. Follow the instructions on the screen to enable or disable the Fast Load feature.
4. When the screen displays the desired setting, press the **SELECT** button to save the changes. Press the **MENU** button to abort.
5. To set other values, continue with the next subsection.

Setting the Date

The Library Status screen displays the current date and time that have been set. This setting is also used for event logging.

1. From the LIBRARY CONFIG screen, line up the cursor with DATE.
2. Press the **SELECT** button. An editing screen appears.

3. At the editing screen:
 - a. Use the up and down arrow buttons to select a value for each portion (field) of the date.
 - b. Use the **SELECT** button to move right to the next field.
 - c. Use the **MENU** button to move left to the previous field.
4. When the screen displays the desired setting, press the **SELECT** button from the right-most field to save entries. Press the **MENU** button to abort.
5. To set other values, continue with the next subsection.

Setting the Time

1. From the LIBRARY CONFIG screen, line up the cursor with TIME.
2. Press the **SELECT** button. An editing screen appears.
3. At the editing screen:
 - a. Use the up and down arrow buttons to select a value for each portion (field) of the time.
 - b. Use the **SELECT** button to move right to the next field.
 - c. Use the **MENU** button to move left to the previous field.
4. When the screen displays the desired setting, press the **SELECT** button from the right-most field to save entries. Press the **MENU** button to abort.
5. To set other values, continue with the next subsection.

Setting Screen Characteristics

To change the contrast and backlight (brightness) of the operator screens:

1. From the LIBRARY CONFIG screen, line up the cursor with DISPLAY INFO.
2. Press the **SELECT** button. The display screen appears.
3. Use an arrow button to select the desired screen characteristic: CONTRAST or BACKLIGHT. An edit screen appears.
4. On the editing screen, use the up and down arrow buttons to save the changes. Press the **MENU** button to abort.
5. When the count value is correct, press the **SELECT** button to save the changes. Press the **MENU** button to abort.
6. To set other values, continue with the next subsection.

Setting Cleaning Cartridge Information

This information relates to the Auto Cleaning Enabled or Disabled feature.

Note. During IPL, the robot audits the reserved cells. If cleaning cartridges are present, it automatically sets the Auto Clean Enabled option for the tape library.

These two terms are defined as:

Auto Clean Disabled

When a tape drive requires cleaning, the compatible cleaning cartridge must be entered into the CAP, using the Clean Drive routine. The robot retrieves the cartridge, mounts the tape cartridge, and returns the cartridge to the CAP when cleaning is completed. The cleaning cartridge must then be removed from the CAP, and its usage be must tracked manually.

Auto Clean Enabled

When a tape drive requires cleaning, the robot will retrieve and mount a compatible cleaning cartridge from the reserved cell in the tape library (See [Figure 5-3](#)). When the cartridge dismounts, the robot returns the cleaning cartridge to its cell location within the tape library. The MPC card keeps track of the usage and posts a message on the operator panel when the usage expires.

If you desire this feature, the cleaning cartridges must be placed in the reserved cells area of the tape library during IPL sequence (See [Figure 5-3](#) for clean cartridge locations).

When this option is available, the customer host software must also support the auto cleaning feature.

If auto cleaning is selected, the cartridge life must also be specified. Cartridge life is the number of times that a cleaning cartridge can be used before its usage expires.

Setting Cleaning Cartridge Life

After a predetermined count, a cleaning cartridge must be replaced and disposed of at the site.

If the Auto Clean feature is enabled, use the operator panel to set the warning threshold, which is the maximum number of times a cleaning can be used.

For CT9840-1/CT9840FC-1/CT9841FC-1 tape cartridges, refer to the *9840 Tape Drive System users Reference Manual* (STK PN 95739).

The cleaning cartridge warning threshold can be set from the Main menu screen. To set the warning threshold:

1. From the online status screen, press the **MENU** button. The Main menu screen appears.
2. Use the arrow button to select CLEANING INFO.
3. Press the **SELECT** button. The CLEANING INFO screen appears. This screen displays the number of cleaning cartridges in the reserved area at initialization.
4. Use an arrow button to select 9840 WARNING COUNT.
5. Press the **SELECT** button for your choice. An editing screen appears.
6. The editing screen displays the current setting for the cartridge warning count. The maximum recommended warning count appears below the current setting. Use the arrow buttons to change the warning count.
7. When the value is correct, press the **SELECT** button to save the changes. Press the **MENU** button to abort.
8. When finished, press the **MENU** button to return to the tape library Status screen.

Entering Tape Drive Information

Note. To configure CT9840-1/CT9840FC-1/CT9841FC-1 tape drives, see “Tape Drive System Product Manual” (STK PN 95741). For further information, please contact StorageTek Product Support at 1-800-525-0369.

An IPL sequence performs an automatic configuration of the tape drives. This sequence assigns local tape drive numbers for all tape drives within the tape library. The uppermost tape drive within the column is designated as 0, the next is 1, and so forth. These drive numbers are only for tape library to tape drive communication.

The SCSI system addresses must be assigned to the drives before the host recognizes them. It also must be specified if the tape drives are on the same SCSI bus as the tape library (on bus) or whether they are on a separate SCSI bus (off bus).

Note. The system manager can provide this information.

SCSI ID for the Tape Drive

The SCSI ID is the system address of the tape drive. This information must be entered for every tape drive within the system.

Note. To set the CT9840-1/CT9840FC-1/CT9841FC-1 addresses, see the “9840 Tape Drive System Product Manual” (STK PN 95741). For further information, please contact StorageTek Product Support at 1-800-525-0369.

Note. For information about setting the DEVICE ID and the valid DEVICE ID ranges using SCF, refer to the “SCF Reference Manual for the Storage Subsystem”. When you configure the tape drive using SCF, the DEVICE ID attribute must match the SCSI ID set on the tape drive.

On Bus or Off Bus

This entry determines whether the tape drive is on the same cable path (on bus) as the tape library or on a separate bus (off bus).

Setting SCSI ID and Bus Status

The tape drive SCSI IDs and bus status choices can be set from the DRIVE CONFIG SCREEN. For each drive:

Note. Due to the size of the tape drive, the operator panel will display dashed lines (- - -) between drives. This is due to the empty (not connected) power and tape transport interface (TTI) connector displayed next to the physical size of the drive.

1. From the tape Library Status screen, press the **MENU** button.
2. If needed, use an arrow button to select DRIVE CONFIG.
3. Press the **SELECT** button. The configuration menu appears.
4. The format of the drive information appears in the following example:

```
00 STK ID: _____
          ON BUS: ON
```

The first two digits are the numbers that the tape library has assigned to the tape drive. The tape library sets this number during its automatic configuration sequence (at power-on or IPL). The drives are numbered from 0-X, top-to-bottom. The number is displayed on the status screen. To view the SCSI ID of each tape drive, this procedure must be manually performed.

Next is the type of tape drive. To the right of the tape drive type is the ID or SCSI address. On the next line is the tape drive's bus status.

5. Use the arrow buttons to select the tape drive that you want to modify and press the **SELECT** button. The SCSI ID edit screen appears.

Note. The operator panel displays only 16 lines per screen. If the tape library contains more than 8 drives, the down arrow button must be used to scroll to drives nine and above.

6. Use the up and down arrow buttons to change the SCSI ID.
7. When the ID is correct, press **SELECT** to save the changes. A message screen indicates that the tape library is saving the new ID. Then the DRIVE CONFIG screen appears.
8. Press the arrow down button once to get to the tape drive's bus status field.
9. Press the **SELECT** button. The bus status edit screen appears.
10. Use the up and down arrow buttons to change the bus status to ON or OFF.

11. When the choice is displayed, press the **SELECT** button to save the changes. Press the **MENU** button to abort. The DRIVE CONFIG screen appears.
12. Continue these steps until the tape drives are configured.
13. To set other values, continue with the next subsection.

Verifying Configuration

When all the configuration entries have been completed, the operator panel notifies you to press the RESET button if a change has been made that requires an IPL.

When the tape library becomes ready, go through the configuration screens to verify all the information is complete.

Performing the Final Steps

When the tape library and all tape drives are configured, perform these final steps before testing the tape library:

1. Power off the tape library.
2. Open the right side door.
For 9840 and 5259 Tape Drives:
 - a. Insert the single connector end of the Y cable into all drives.
 - b. Install the client Fibre Channel cables.
 - c. Check that all tape drive power switches are in the ON (1) position.
3. Power on the tape library. An initialization sequence (described next) begins.

Initialization Sequence

An IPL occurs when the tape library powers on or the RESET button is pressed. The IPL process consists of functional firmware loading.

The MPC card directs the initialization process, which consists of the following:

- Initialization and calibration of robotic mechanisms
- Calibration of the vision system
- Motion testing
- Hand assembly testing
- An audit of tape cartridges within the tape library
- Audit of reserved cells

These steps are explained in the next sections.

Initialize and Calibrate Mechanisms

Robotic mechanism parameters are loaded into processor memory and calibration routines are executed. The initialization process requires a maximum of five minutes. Monitored in this sequence are:

- Reach save position. The reach mechanism fully retracts, and the reach save sensor must be detected before any theta or Z motion is initiated. This prevents possible damage to the hard assembly or to a tape cartridge.
- Z motor calibration. The Z mechanism moves from the end-stop to end-stop. The distance and time for this motion is compared against the mechanism parameters within the firmware.
- Theta motor calibration. The theta mechanism moves from theta-stop to theta-stop. The distance and time for this motion is compared against the mechanism parameters within the firmware. There are three capacity variations for the tape library (1/3, 2/3, and full), and the tape library size is also determined during this step.

Vision Calibration

After calibration of the robotic motors, the robot moves to the vision calibration decal (below Drive Column 0 at Panel 0). Thresholds for the line scan camera are:

- Target is the readability and accuracy of the target image for locating array positions.
- Bar Code is the readability and accuracy of bar code information.

Note. The camera is operational during initialization, during audit, and when tape cartridges are entered into a CAP.

During normal operation, the camera is turned off, and tape cartridges are located by referencing the VOLSET and cell location within the MPC card memory.

Hand Assembly Testing

Calibration and testing of the hand assembly is accomplished near the vision calibration decal. The proximity sensor is aimed at the decal and tested to be on. The hand is then moved away from the decal, and the sensor is tested to be off.

The gripper mechanism is extended to test for proper opening and closing.

Audit

The next step for initialization is the audit of the tape library. The audit process requires five minutes.

Audit Definitions

An audit is the process of checking each cell within a tape library. If a cell contains a tape cartridge, the camera reads the VOLSER and transfer this data to the MPC card. The MPC card calculates the robotic position of the hand assembly (by referencing the theta and Z positions) and catalogs the tape cartridge location by:

- VOLSER
- SCSI element number or panel, row, column

If a customer cell is empty, the location is recorded as “cell empty.” The reserved cells (explained later in this section) are checked for cleaning cartridges (which automatically configure the auto clean option) and for diagnostic test cartridges.

When all customer and reserved cell locations are read and cataloged, the tape library audit is complete. However, the tape library audit information must be requested by the host system to update its tape cartridge volume database.

This two-step process-tape library audit and host update ensures that both the tape library and host have current (and identical) listings of the tape library contents.

Note. Tape cartridges left in the drives are not audited.

Audit Conditions

An audit begins when:

- The tape library is powered on.
- The RESET button on the operator panel is pressed.
- The tape library access door is opened and closed.
- A system request to audit the tape library is entered t the host console.

Tape Drive Targeting

In the next step of the initialization process, the robot moves to each tape drive and calculates the position of the drive's target. This ensures accurate loading of tapes during tape library operation.

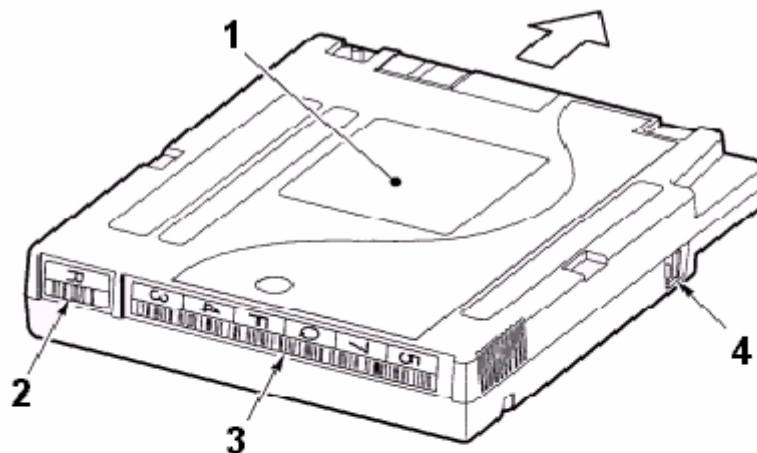
Audit Drive Targeting

After tape drive targeting, the robot audits the 12 cells of the reserved area, located below CAP B (for tape libraries with two CAPs) or below the front viewing window (for tape libraries with one CAP).

Testing the Tape Library

This section describes diagnostic and cleaning tape cartridges within the tape library and describes diagnostic tests that are performed before placing the tape library online.

Figure 5-2. CT9840-1/CT9840FC-1/CT9841FC-1 Cartridge



9840 Cartridge

- 1. Customer label
- 2. Media ID label ("R" = data, "U" = cleaning)
- 3. VOLSER label
- 4. Write protect switch

Installing Diagnostic and Cleaning Cartridges

If diagnostic and cleaning cartridges are being installed, place them within the tape library prior to initialization.

Use diagnostic cartridges to run motion and loading tests for cartridge drives.

-
- △ **Caution.** Check with the system administrator for the tape drive cleaning option that is to be used. The auto clean option is automatically configured when cleaning cartridges are placed in the reserved area.
-

Automatic cleaning activates the robot to load and unload a cleaning cartridge when a tape drive requires cleaning.

Labeling Cartridges

[Figure 5-2](#) shows the correct placement of labels for tape cartridges.

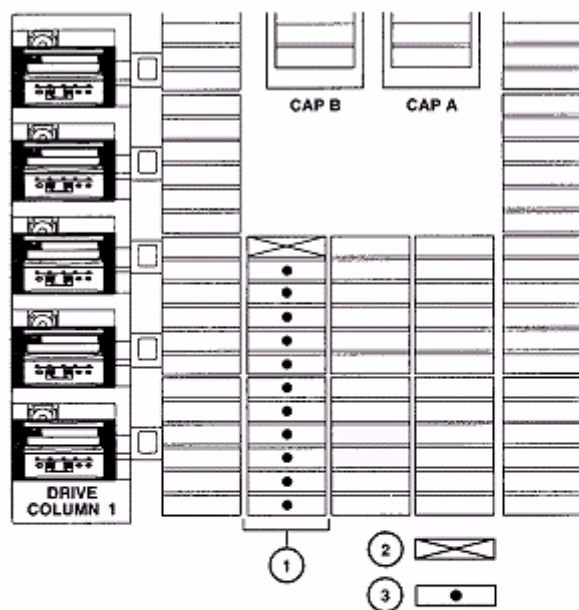
To apply the diagnostic and cleaning labels:

1. From the installation kit, obtain the cartridge label packages: STK PN 309952901 for CT9840-1/CT9840FC-1/CT9841FC-1 cleaning cartridges.
2. Attach a CLN label to all applicable cleaning cartridges.
3. Attach a DG 000 label to all applicable diagnostic cartridges.

Diagnostic and Cleaning Cartridge Cells

The following procedure applies to the Reserved Cells area (shown in [Figure 5-3](#)). This area is reserved for cleaning and diagnostic cartridges for each tape drive type. The reserved cells are located below CAP B (for tape libraries with two CAPs) or below the front viewing window (for tape libraries with two CAPs), or below the front viewing window (for tape libraries with only one CAP).

Figure 5-3. Reserved Cells



Reserved Cells

1. Location of reserved cells
2. Swap cell (Leave empty)
3. Diagnostic/Cleaning cartridges

Reserved Cell Descriptions

In [Figure 5-3](#) on page 5-15, the top cell is reserved for in-transit cartridges. Do not place any cartridges into this cell. This cell has two functions:

- It allows the robot to swap tape cartridges within the tape library.
- It is used as a drop-off cell in case the tape library loses power and the robot has a cartridge in the hand.

When power is restored, the robot automatically places this cartridge in the drop-off cell as part of the robotic initialization sequence.

Any type of cleaning or diagnostic cartridge can be placed in the other 11 cells. Alternately, these 11 cells can be left empty.

△ **Caution.** Do not place data cartridges in these cells. The reserved cells are limited to cleaning and diagnostic cartridges only.

Ask the system administrator if the Auto Clean option is desired. If host software supports this option, the cleaning tape cartridge can be placed in the lower 11 cells. When the robot detects cleaning cartridges, the tape library automatically configures the auto clean.

If auto clean is not desired, do not place cleaning tape cartridges in these cells.

To install diagnostic and cleaning cartridges:

1. Open both the right and left front doors of the tape library.
2. Check that the top cell is empty.
3. Place cleaning and diagnostic cartridges in any of the other cells in the reserved area (Refer to [Figure 5-4](#) on page 5-19).

Running Diagnostic Tests

To test the tape library operation before placing it online, run diagnostic tests. The two suggested diagnostic tests are the Get-Put and the Mount-Dismount tests.

Running the Get-Put Loop Diagnostic Test

The Get-Put loop test validates cell-to-cell move capabilities using a diagnostic cartridge. The robot:

- Retrieves (gets) the diagnostic cartridge from its reserved cell
- Moves the hand and cartridge laterally and vertically
- Places (puts) the cartridge back into the reserved cell

To run the Get-Put diagnostic test:

1. Check that the tape library is offline.
2. Check that the main access door is closed and the tape library menu is displayed.

3. Check that there is a diagnostic cartridge in the reserved area.
4. From the Status screen, press the **MENU** button on the operator panel.
5. Use the down arrow button to select DIAGNOSTICS.
6. Press **SELECT**. The DIAGNOSTICS screen appears.
7. Use the down arrow button to select GET-PUT LOOP.
8. Press **SELECT**. The GET/PUT option screen appears.
9. Follow the screen directions to set the number of times for the test to run.
10. At the “ARE YOU SURE?” prompt, confirm that the tape library is in maintenance mode (offline) before beginning the test. Confirm by pressing the **SELECT** button.
11. After this diagnostic test runs to completion, press **MENU** to return to the DIAGNOSTIC menu.

Running the Mount-Dismount Loop Diagnostic Test

The Mount-Dismount loop diagnostic test validates the ability of the robot to load and unload a cartridge to a tape drive. The robot:

- Retrieves a diagnostic tape cartridge
- Loads the tape cartridge into a tape drive

When the drive dismounts the cartridge, the robot:

- Retrieves the tape cartridge
- Places it back in its reserved cell

To run the Mount-Dismount diagnostic test:

1. Check that both the tape library and target drive are offline.
2. Check that the main access door is closed and the tape library menu is displayed.
3. Check that there is a diagnostic cartridge in the reserved area.
4. From the Status screen, press the **MENU** button. The Main menu appears.
5. Use the down arrow button to select DIAGNOSTICS.
6. Press the **SELECT** button. The DIAGANOSTICS screen appears.
7. Use the down arrow button to select DRIVE DIAGNOSTICS.
8. Press **SELECT**. The list of available tape drives appears.
9. Use the arrow button to select the tape drive to be mounted.
10. Press the **SELECT** button. The list of drive diagnostic tests appears.
11. Use the arrow button to select MOUNT/DISMOUNT LOOP.

12. Press **SELECT**.
13. At the “ARE YOU SURE?” prompt, confirm that the tape library is in Maintenance Mode (offline) before beginning the test. Confirm by pressing the **SELECT** button.
14. After this diagnostic test runs to completion, press the **MENU** button to return to the DIAGNOSTICS menu.

Running Other Diagnostic Tests

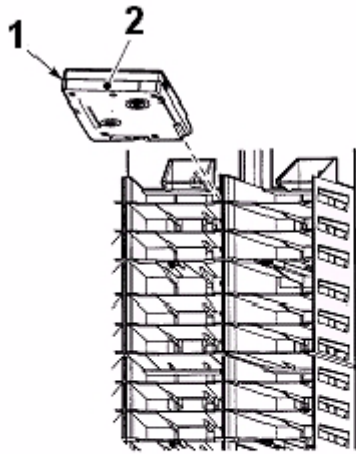
You might want to run all diagnostic tests. Descriptions of other test follow:

Clean Drive	Mounts and dismounts a specified cleaning cartridge to a tape drive.
Mount	Mounts a diagnostic tape cartridge to a selected tape drive.
Dismount	Dismounts a diagnostic tape cartridge to a selected tape drive.
Demo Mode	Start a Get-Put Loop with customer cartridges simulate tape library operation (See the Caution below).

△ **Caution.** An audit update is required when the DEMO MODE completes. Perform an IPL of the tape library to re audit it. Then notify the customer to update the host cartridge database.

Loading Tapes Into the Tape Library

When diagnostic tests are completed, you can load the production tape cartridges inside the tape library. The most efficient way to load a great quantity of tape cartridges in the tape library is to manually load them into the array of cells. [Figure 5-4](#) on page 5-19 illustrates this method.

Figure 5-4. Placing Tape Cartridge Into the Tape Cartridge Array Cells

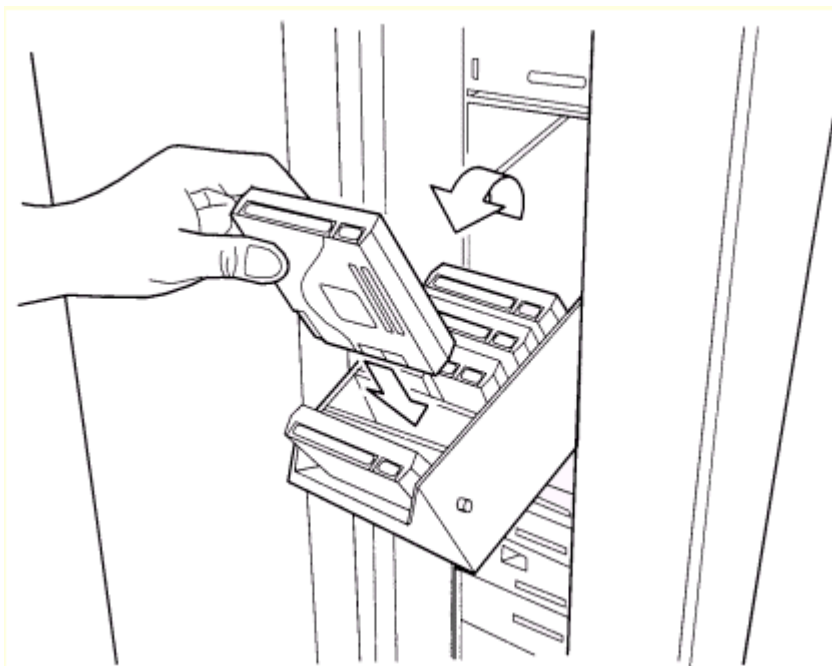
Placing Tapes into Array Cells

- 1. 9840 cartridge**
- 2. 9840 cartridge label**

Once you load all the tape cartridges, close and lock the main door. The robot automatically audits the tape cartridges and their locations within the tape library.

When the tape library is placed online, enter the command to update the host's tape cartridge database. The tape library audit information is then sent to the host.

Tape cartridges can also be entered through the CAP. [Figure 5-5](#) on page 5-20 shows the CAP entry method.

Figure 5-5. Loading the CAP with a 9840 Tape Cartridge

CAP Operation

Tape cartridges are entered into and ejected from the CAP. Each CAP has four magazines, numbered one through four, from the top location to the bottom. Each cell location in a CAP is assigned an element number.

There is no restriction on how cartridges are entered into a magazine or CAP. When the CAP door is closed, the robot audits all CAP cell locations for cartridges.

For ejection of cartridges, however, the robot places the target cartridge into the lowest available element number first. Therefore, an ejection process within a tape library that has two CAPs, for instance, begins at the optional CAP (CAP B) because it has the lowest element number.

Placing the Tape Library Online

When you are ready to use the tape library for production, have the operator enter the system command to place the tape drives and tape library online.

6

Operating the Tape Library

This section covers:

Operating in Automated Mode	6-1
Powering Off the Tape Library	6-9
Operating In Manual Mode	6-9

Note. When the client controls the tape library, refer to the software publications and enter the command at the server console to perform the desired activity. For some activities, you might need to ask the systems administrator for the required information.

Operating in Automated Mode

Automated mode is the normal operating mode of the library. When the tape library is online and the robot is mounting and dismounting cartridges, monitor the server operator console and the tape library operator panel for messages and respond appropriately.

When a tape library is online, you might also need to:

- Enter cartridges into the tape library through the cartridge access port (CAP)
- Eject cartridges from the tape library through the CAP
- Replace a cleaning tape cartridge
- Manually clean a tape drive
- Review the FSC log
- Run diagnostic tests

The next sections describe how to perform these activities.

Monitoring Status Information

You can monitor the tape library, CAP, and tape drive status information through the tape library status screen. You can also monitor CAP magazine status and the cleaning cartridge usage count through operator panel menus.

Tape Drive Status

Table 6-1 summarizes tape drive status messages that might appear on the tape library status screen.

Table 6-1. Tape Drive Status Messages

Status Messages	Explanation
INIT REQUIRED	You must initialize the tape drive.
NOT CONNECTED	This tape drive is not connected to a SCSI bus.
UNKNOWN DRIVE	The tape library does not recognize the type of tape drive in this location.
NOT COMMUNICATE	This tape drive is not communicating with the client, or the tape drive is powered off.
NOT FUNCTIONAL	This tape drive is not functioning properly.
NOT LOADABLE	The tape library cannot load a cartridge into this tape drive.
CARTRIDGE IN	The tape drive contains a tape cartridge, but the tape cartridge is loaded in this tape drive.
CLEAN NEEDED	This tape drive requires cleaning.
CLEAN FAILED	The attempt to clean this tape drive failed.
LOADING	The tape library is mounting a cartridge into this tape drive.
REWOUND	The cartridge in this tape drive has been rewound.
UNLOADING	The tape library is dismounting a cartridge into this tape drive.
LOADED	The tape library has loaded a cartridge into this tape drive.
REWINDING	The cartridge in this tape drive is being rewound.
BUSY	This tape drive is performing a read or write operation.
CLEANING	The tape drive is being cleaned.

Note. The operator panel displays only 16 lines per screen. If the tape library contains more than 8 tape drives, you must use the down arrow button to scroll to drive 09 and higher.

Monitoring Tape Drives

To view the details about an installed tape drive, including its serial number and firmware version.

1. Press the **MENU** button to display the Main menu.
2. If necessary, press an arrow button to select **DRIVE INFO**.
3. Press the **SELECT** button. A list of all the installed tape drives appears.
4. Use the arrow buttons. A list of all the installed tape drives appears.
5. Press the **SELECT** button. The Drive Information menu appears (See [Figure 4-5, Drive Information Menu](#), on page 4-6). The screen lists the manufacturer, model, status, serial number, interface type, and firmware version of the selected tape drive. See [Table 6-1](#) for a list of tape drive messages.

Monitoring CAP Magazine Status

To check the status of a CAP magazine and its contents:

1. Press the **MENU** button to display the Main menu.
2. If necessary, press an arrow button to select **CAP STATUS**.
3. Press the **SELECT** button again. The CAP Contents menu appears. The screen lists the VOLSER of each cartridge in an installed magazine, or it lists a status message (See [Table 6-2](#)).
4. Press the **SELECT** button again. The CAP Contents menu appears. The screen lists the VOLSER of each cartridge in an installed magazine, or it lists a status message. [Table 6-2](#) lists status messages.

Note. Each CAP has four magazines, numbered one through four from the top location to the bottom.

Table 6-2. CAP Status Messages

Status Message	Explanation
EMPTY	This magazine slot does not contain a cartridge.
UNKNOWN	This magazine slot contains a cartridge, but the tape library has not yet performed the necessary audit to identify the cartridge.
UNREADABLE	This magazine slot contains a cartridge, but the camera could not read the cartridge's VOLSER label.

Checking the Cleaning Cartridge Usage Count

This procedure assumes that you have loaded cleaning cartridges into the reserved cells and has subsequently reset the tape library. (Taking these steps enables the Auto Clean function.) To check the number of times the cleaning cartridges have been used since they were installed in the tape library:

1. Press the **MENU** button to return to the Main menu.
2. Press the arrow buttons to select **CLEANING INFORMATION**.
3. Press the **SELECT** button. The panel displays the Cleaning Info menu.
4. Press the arrow buttons to select **EXPORT CLEANING CARTRIDGE**.
5. Press the **SELECT** button. The export screen appears, listing all installed cleaning cartridges by domain (or cartridge type), VOLSER, and usage count.

Note. If the usage count for a cleaning cartridge has exceeded its warning count, the export screen displays EXPIRED. You must remove this cartridge from the tape library.

6. Press the **MENU** button to exit the export screen.

Entering Cartridges Through the CAP

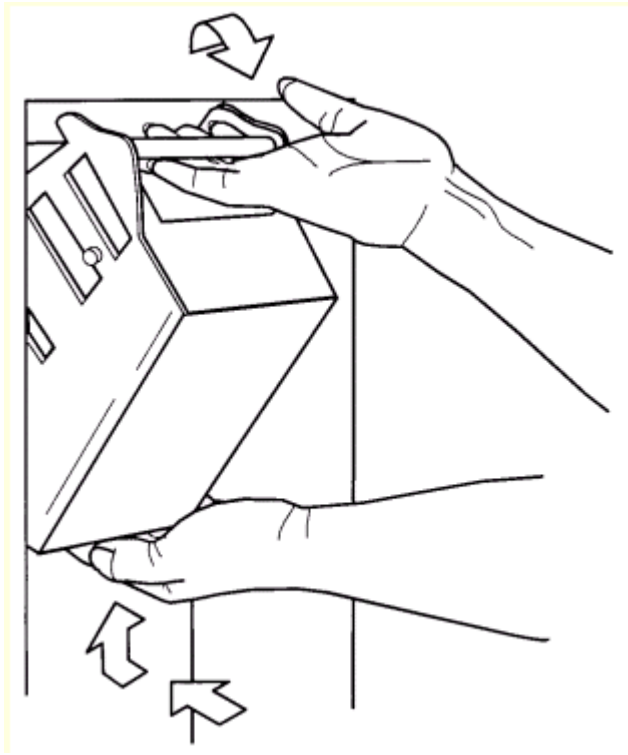
To unlock the CAP, open it, and place cartridges into it:

1. Enter the console command to unlock the CAP.
2. Press the **CAP A** or **CAP B** button on the operator panel to open the CAP. The indicator lights.

△ **Caution.** The cartridges must be entered properly. If not, robot or tape drive may be damaged, or the tape library could stop operating. Use only 9840 cartridges for 9840 tape drives.

3. Load the cartridges into the magazine. This can be done in one of two ways:
 - Pull out and down on the magazine handle.
 - Remove the magazine by lifting it out. (See [Figure 6-1](#) on page 6-5.)

Figure 6-1. Removing the CAP Magazine



Note. The snap-on retention cartridge cover can be used to keep cartridges in place when you carry the magazine. Remove the clear cover from the back of the magazine by lifting the side edge. To protect the cartridges, place the slots on one edge of the cover into the grooves on the sides of the magazine's top panel and snap the other edge into place.

4. Enter the cartridges into the magazine so they lie flat, with the bar code up and the reel facing away from you.

△ **Caution.** Remove the retention cover before loading the magazine into the CAP.

5. Return the magazine to its closed position. (If a retention cover is used on the magazine, remove the cover before replacing.)
6. Press the **CAP A** or **CAP B** button on the operator panel to close the CAP.

Note. It is strongly recommended that unlabeled cartridges not be entered into the CAP.

Ejecting Cartridges Through the CAP

To unlock the CAP, open the CAP, and remove the cartridges from it:

1. At the console, enter the VOLSERS of the cartridges that are required. The robot retrieves the cartridges and inserts them in the CAP.
2. Enter the console command to open the CAP. This unlock the CAP.
3. Press **CAP A** or **CAP B** button on the operator panel to open the CAP.
4. Remove or pull down the magazine and remove the cartridges. Store them outside the tape library.
5. Repeat these steps until all the required cartridges have been removed.
6. Press the **CAP** button to close the CAP.
7. For further instructions, refer to the console and software documentation.

Cleaning a Tape Drive Manually

If the Auto Clean function for the tape library is not enabled, the tape library status screen on the operator panel displays “Clean Needed” whenever a specific tape drive needs cleaning. To clean this tape drive:

1. Enter the console command to open the CAP. This unlocks the CAP.
2. Press the **CAP** button on the operator panel to open the CAP.
3. Insert the required cleaning cartridge in the CAP.
4. Press the **CAP** button to close the CAP.
5. Press the **MENU** button until the Main menu displays.
6. Press the arrow button to select DIAGNOSTICS.
7. Press the **SELECT** button. The panel displays Main Diagnostics menu.
8. Press the arrow buttons to select DRIVE DIAGNOSTICS.
9. Press the **SELECT** button. The screen displays a list of all installed tape drives.
10. Use the arrow buttons to select the tape drive.
11. Press the **SELECT** button. The Diagnostic for Drive menu appears.
12. Press the arrow button to select **CLEAN DRIVE**.
13. Press the **SELECT** button. A message indicates that the tape drive will be cleaned at the next opportunity.
14. When the cleaning is complete, the robot returns the cleaning cartridge to the CAP.
15. To clean another tape drive of the same type, press the **MENU** button to return to the lists of tape drive, and repeat Steps 10 through 14.

16. When tape drive cleaning is complete, press the **CAP** button to open the CAP.
17. Remove the cleaning cartridge, and make a record of how many times it has been used.
18. Press the **CAP** button to close the CAP.

Note. The Auto Clean feature is automatically enabled if even one cleaning cartridge is loaded into the reserved cell area and then the tape library is reset.

Reviewing FSC Logs

A SDE or other Storage Tek representative might ask you to review the tape library's Fault Symptom Code (FSC) log so you can better analyze tape library related problems. The FSC log records significant events, warnings, and errors that the tape library generates during operation.

To review the FSC log:

1. Press the **MENU** button until the Main menu appears.
2. If necessary, press the arrow buttons to select FSC LOGS.
3. Press the **SELECT** button. The panel displays the FSC log screen.
4. Use the arrow buttons to scroll through the log.

This sample entry from the FSC logs screen is followed by an explanation of the entry elements:

3329	03	NONE
03/01/2002	14:46:14	

- | | |
|-------------------|--|
| 3229 | This 4-character code is the FSC. |
| 03 | This value indicates the number of times this FSC has occurred. |
| NONE | This message indicates which, if any, mechanical device was involved. |
| 03/01/2002 | These digits indicate the date the FSC occurred. The fields from left to right are month, day, and year. |
| 14:46:14 | These digits indicate the time the FSC occurred. The fields from left to right are hour, minutes, and seconds. |

Running Diagnostic Tests

Diagnostic tests included in the tape library's firmware let you control certain aspects of the tape library's operation. The tape library can be placed in the demonstration mode through the Diagnostics screen. The tests are listed in Table 6-3.

Table 6-3. Tape Drive Diagnostic Tests

Test	Description
Clean Drive	This function is not a test. It moves a specified cleaning cartridge from the CAP to a tape drive and initiates tape drive cleaning. When cleaning is complete, it returns the cleaning cartridge to the CAP. This routine does not require the tape library to be offline.
Mount	This test mounts a diagnostic tape to the selected tape drive.
Dismount	This test dismounts a diagnostic tape from the selected tape drive.
Mount-Dismount	This test mounts and dismounts a diagnostic tape from the selected tape drive.

△ **Caution.** Only trained personnel should perform diagnostic tests. Before performing the diagnostic tests, check that the tape library and tape drives are offline.

Running Tape Drive Diagnostic Tests

To run a diagnostic test on a tape drive:

1. Place the tape library and tape drives offline.
2. Press the **MENU** button until the Main menu displays.
3. Press the arrow buttons to select DIAGNOSTICS.
4. Press the **SELECT** button. The panel displays Man Diagnostic menu.
5. Press the arrow buttons to select DRIVE DIAGNOSTICS.
6. Press the **SELECT** button. The screen displays a list of all installed tape drives.
7. Use the arrow buttons to select the desired tape drive.
8. Press the **SELECT** button. The Diags for Drive menu appears.
9. Press the arrow buttons to select the desired test. For a description of the available tests, see [Table 6-3](#).
10. Press the **SELECT** button. If MOUNT/DISMOUNT LOOP was selected, an editing screen appears:
 - a. Use the arrow buttons to enter the desired value. (The up arrow button increases the value. The down arrow button decreases the value.)
 - b. Press the **SELECT** button.

11. You will be prompted to confirm that the tape library should be in Maintenance Mode (offline) before beginning the test. To confirm, press **SELECT**. To abort, press **MENU**.
12. Wait until the test is complete. The screen displays TEST COMPLETE.
13. Press the **RESET** button to reset the tape library.

Powering Off the Tape Library

1. Enter the command at the server console to remove the tape library and tape drives from online status.
2. Press down on the switch or switches (breakers) behind the right front door of the tape library.

Operating In Manual Mode

The following pages describe operations that you can perform when the tape library is in the manual mode. Manual mode takes effect when the tape library is not online or loses power.

When the tape library is offline, you might need to:

- Open the front door
- Move the robot
- Locate a cartridge in the storage cells
- Remove a cartridge from the hand
- Mount a cartridge from a tape drive

Before starting any of these tasks, take precautions against electrostatic discharge (ESD).

△ **Caution.** Even a small electrostatic discharge can damage an electrical component inside the tape library. A damaged component might not fail immediately, but it will become worse over time, possibly causing intermittent problems. Be sure to touch gray, unpainted metal before reaching inside the tape library.

After you open the library door:

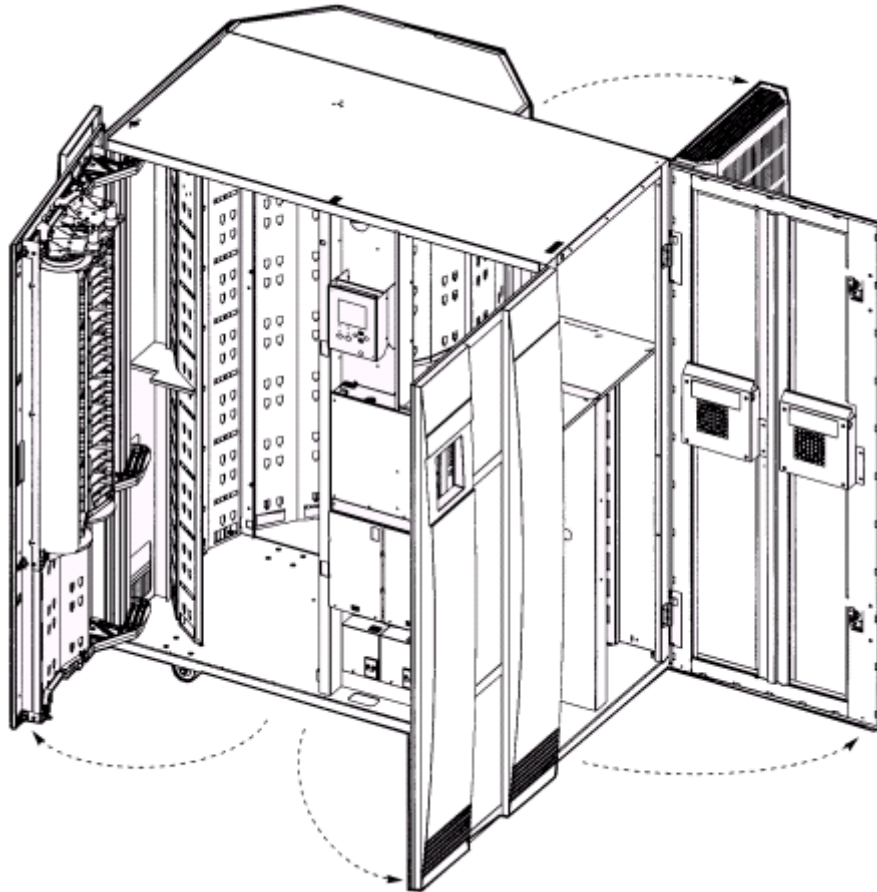
1. Touch a gray, unpainted metal surface, such as the tape library frame just inside the front door.
2. Keep all body movement to a minimum as you touch the tape drives and tape library components.

Antistatic wrist straps with clip-on ends are commercially available.

Opening the Tape Library Front Doors

You must open the front doors on the tape library to perform manual operations. Refer to [Figure 6-2](#) as you perform this procedure.

Figure 6-2. Opening the Access Doors



-
1. Check that all jobs have ended and that the tape library is offline.
 2. Open the tape library right front door by pulling on the left side of the door.
 3. Open the tape library left front door by using a latch key to unlock both locks. Turn the key counterclockwise to unlock them, and then pull open the door.

Moving the Robot

After the tape library doors have been opened, the robot might need to be move to make it easier to access the stored cartridges or the tape drives. Read and observe the following caution before attempting to move any portion of the robot.

-
- △ **Caution.** To prevent damage to the hand or Z carriage, check that the reach mechanism on the hand is fully retracted before moving any part of the robot. Push the gripper mechanism into the retracted position. If the tape library goes offline due to a power failure, the reach mechanism might be extended into a storage cell or tape drive. If the robot is rotated when this condition exists, the hand could be damaged.

Move the Z column and Z carriage only as shown in [Figure 2-6](#) and [Figure 2-7](#).

Take precaution against potential ESD damage by touching gray, unpainted metal before reaching into the tape library. Do not touch exposed electrical parts when moving any part of the robot.

Raising and Lowering the Hand-camera

If you need to raise or lower the hand, slowly and carefully move it by placing your fingers on the hand-camera assembly.

Rotating the Z Column

If you need to rotate the Z column, grasp it and carefully rotate it, as shown in [Figure 2-6](#).

Locating a Cartridge in the Storage Cells

[Figure 5-1](#) show the locations of the panels, rows, and columns of the cartridge storage cells in the tape library. The decal at the top of each column also provides location information. To remove a cartridge from a storage cell, slide the cartridge out.

Removing a Cartridge From the Hand

If the tape library loses power, a cartridge might be left in the hand. It can be removed from the hand and mounted into a tape drive for a read/write operation.

-
- △ **Caution.** Follow the procedures described in “[Moving the Robot](#).” Failing to do so could damage the hand.

Do not touch any electronic components on the hand assembly. The components could easily be damaged.

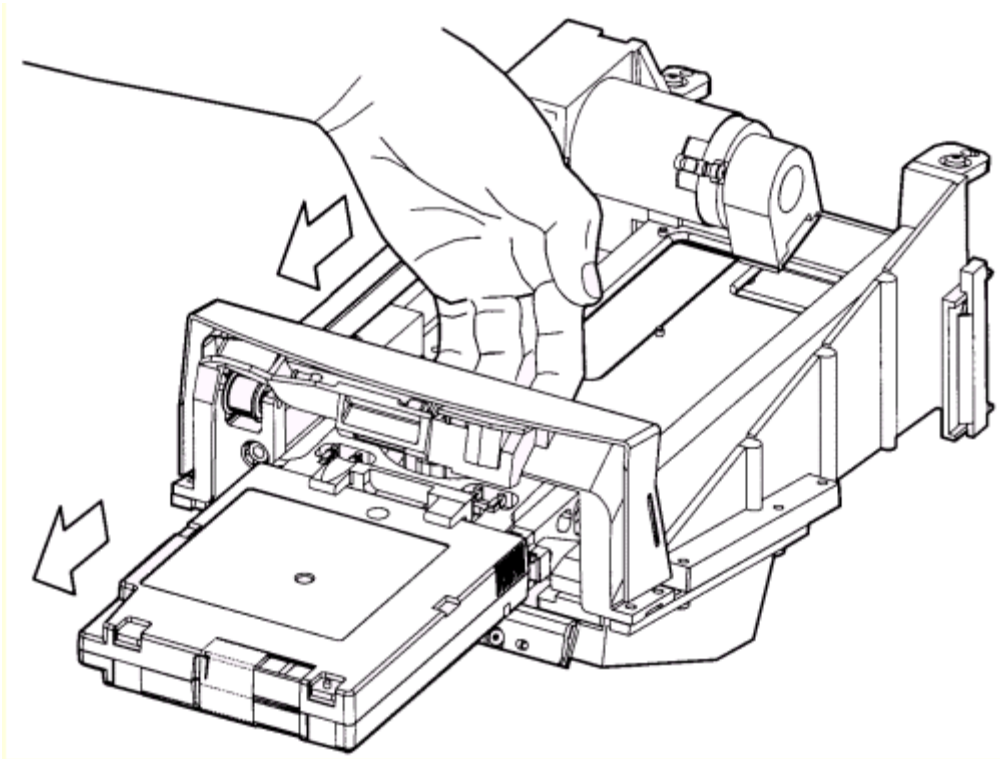
To remove the cartridge from the hand:

1. Rotate the Z column. Move the hand until it is facing the front door.

2. Push on the back of the reach mechanism until the gripper is extended to its full position, as shown in [Figure 6-3](#).

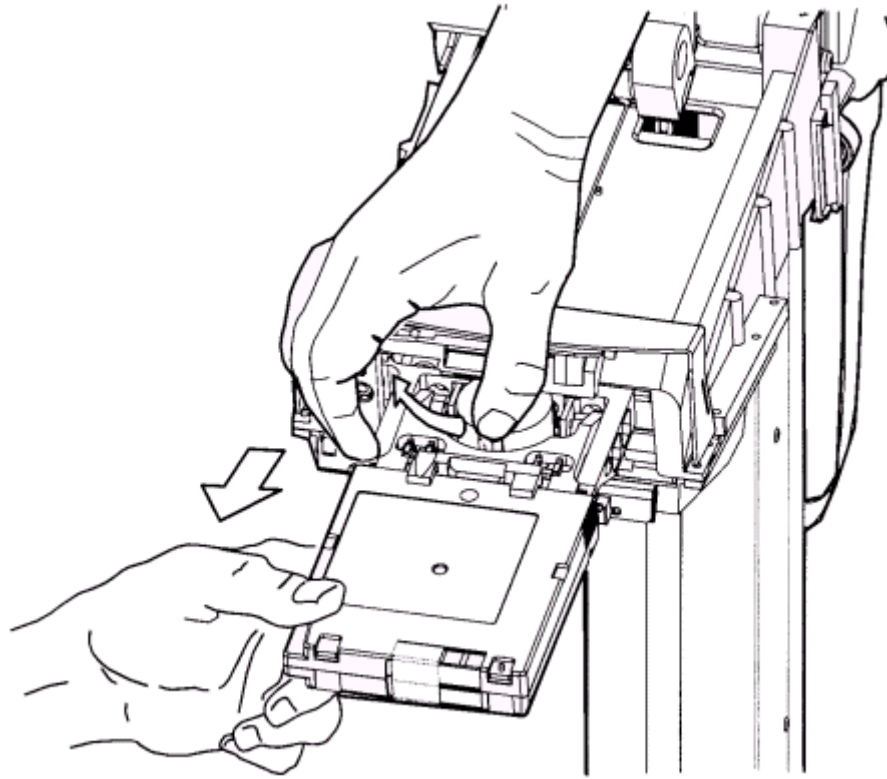
△ **Caution.** If the robot has been active, the solenoid and switch might be too hot to touch. Wait for the solenoid to cool before touching it.

Figure 6-3. Extending the Gripper



3. Hold the solenoid on top of the reach mechanism with one hand and grasp the cartridge with the other. Rotate the solenoid switch clockwise until the cartridge is released from the gripper, as shown in [Figure 6-4](#) on page 6-13.

△ **Caution.** Check that the gripper mechanism is fully retracted. If it is left extended and the robot is turned, the gripper mechanism will strike a storage cell. If it is left extended and the hand is facing the tape library door when it is closed, the door will strike the gripper mechanism.

Figure 6-4. Removing the Cartridge From the Hand

-
4. Push the gripper mechanism back into the hand until the mechanism is fully retracted.

Loading and Unloading Cartridges Manually

When the tape library is offline, you can load a cartridge in a tape drive or unload it from a tape drive after you take adequate precautions. The following pages provide manual load and unload procedures.

Note. If any cartridges are manually loaded, they must be either manually unloaded and stored in a cell or removed.

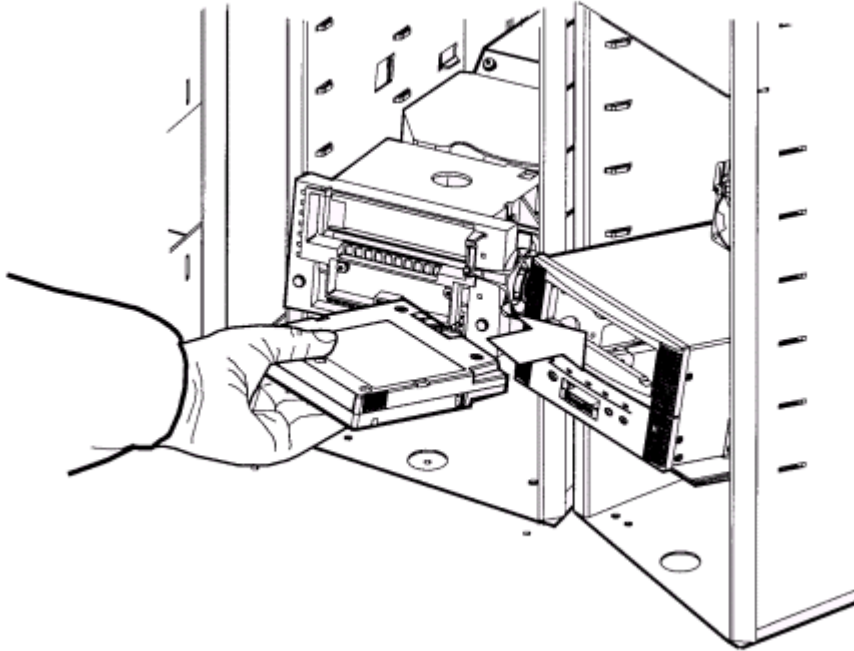
Loading a Cartridge Into a Tape Drive

To load a cartridge:

1. Obtain the cartridge VOLSER, location, and tape drive number from the server console.
2. Open the tape library right front door by pulling on the left side of the door.

3. Open the tape library left front door by using a latch key to unlock both locks (See [Figure 6-2](#).) Turn the key counterclockwise to unlock the locks, then pull the door open.
4. Locate the cartridge. See [Loading Tapes Into the Tape Library](#) on page 5-18.
5. Insert the cartridge into the tape drive as shown in [Figure 6-5](#).

Figure 6-5. Loading a Cartridge Into the 9840 Tape Drive



-
6. After you insert the cartridge:

- For the 9840 tape drive:

Wait for one of the following messages to appear on the tape drive's front panel and take the appropriate action, if necessary:

- The Ready F (File Protected) message appears when a write-protected cartridge loads successfully.
- The Ready U (File Unprotected) message appears when a cartridge that is not write-protected loads successfully.
- The NTReady message appears when the tape in the cartridge has lost tension. To correct this condition, follow the instructions outlined in the *9840 Tape Drive System user's Reference Manual*.

- For the 5259 tape drive:
 - The green light flashes while the cartridge is loading.
 - When the green light stays lit, the cartridge has finished loading.

Unloading a Cartridge From a Tape Drive

To unload a cartridge from a 9840 tape drive:

1. Check that the 9840 tape drive is not selected by the client.
2. Obtain the drive number from the server console and place the tape drive offline.
3. Open the tape library right front door by pulling on the left side of the door.
4. Open the tape library left front door by using a latch key to unlock both locks (See [Figure 6-2.](#))
5. Press the UNLOAD switch on the front of the tape drive.

One of the following conditions can occur:

- After the tape cartridge rewinds, the tape cartridge ejects from the tape drive. Remove the tape cartridge from the tape drive.
- The tape cartridge fails to eject after the tape cartridge rewinds. To correct this condition, refer to the *9840 Tape Drive User's Reference Manual*.
- If the UNLOAD switch is pressed during a write operation, the tape drive tries to write the remaining data before the cartridge unloads. If the UnWrxxxx (Unwritten Data) message appears, where the xxxx is the fault symptom code, the attempt failed, and some data remains unwritten to the tape cartridge. For more information about recovering from an Unwritten Data condition, refer to the *9840 Tape Drive User's Reference Manual*.

Returning the Tape Library to Online Status

To return the tape library to online status for automated operations:

1. Refer to your specific tape drive publications. For instructions on making the tape drives ready.

Note. If any cartridges are manually loaded, they must be manually unloaded and stored in a storage cell or removed from the tape library.

2. Close and lock the tape library doors. The robot performs an audit of the cells.
3. Place the tape library online by entering the command at the server operator console.
4. Give the client command to upload audit to the client.

7 Tape Drives in the CTL700 Tape Library

This section covers:

[Supported Tape Drives](#)

[7-1](#)

[CTL700 Interface Components](#)

[7-3](#)

Supported Tape Drives

These tape drives are supported for a connection to a CTL700 tape library:

- CT9840-1 tape drive
- CT9840FC-1 tape drive
- 5259 tape drive
- N1521A tape drive
- CT9841FC-1 tape drive
- M8503 tape drive

The supported tape drives and their respective power supplies are field-replaceable units (FRU). Contact your service provider if the tape drives require servicing.

The CTL700 tape library can accommodate up to twelve CT9840-1/CT9840FC-1/CT9841FC-1 tape drives, up to twenty 5259 tape drives, up to twenty N1521A tape drives, and up to twenty M8503 tape drives. A combination of all these tape drives can be configured.

Data Compression

The supported tape drives can write compressed or uncompressed information to a labeled or unlabeled tape cartridge. Compression increases the cartridge capacity (over the uncompressed format) by two to three times.

Writing compressed data on a tape cartridge means the tape drive compresses data whenever possible. The specific amount of data stored on the tape cartridge is not predictable because the amount of compression varies with the type of data being written. For this reason, the amount of compressed data stored on tape cartridges can vary significantly.

Tape Drive	Storage Capacity
CT9840-1/CT9840FC-1	Up to 60 gigabytes (GB) on a 9840 data cartridge
5259	Up to 220 gigabytes (GB) on a SuperDLTtape cartridge
N1521A	Up to 400 gigabytes (GB) on a LTO tape cartridge
CT9841FC-1	Up to 120 gigabytes (GB) on a 9840 data cartridge
M8503	Up to 800 gigabytes on (GB) on an Ultrium 3 cartridge

Performance of the Tape Drive

The CT9840-1/CT9840FC-1, 5259, N1521A, CT9841FC-1, and M8503 tape drives store and share information reliably and quickly. They offer the speed, capacity, and access demanded by today's storage-intensive applications and active users. Mainframe-class reliability allows continuous and confident operation. Utilize space more efficiently by attaching more drives to a new or existing library.

The subsystems have these characteristics:

- Faster backup and restore operations:
 - Move or retrieve data with simultaneous read or write to each controller transport unit. First access to data averages 8 seconds for the CT9840-1/CT9840FC-1/CT9841FC-1 tape drive and 70 seconds for 5259 tape drive.
- Store more data:
 - CT9840-1/CT9840FC-1 tape drive: Each cartridge holds up to 20 GB uncompressed (60 GB with compression).
 - 5259 tape drive: Each cartridge holds up to 110 GB uncompressed (220 GB with compression).
 - N1521A tape drive: Each cartridge holds up to 400 GB (2:1 compression).
 - M8503 tape drive: Each cartridge holds up to 800 GB (2:1 compression).
 - CT9841FC-1 tape drive. Each cartridge holds up to 40 GB uncompressed (120 GB with compression)
- Flexible. Mix combination of additional drives to new or existing libraries.
 - Attach a combination of additional drives to new or existing libraries.

Robotic Cartridge Loader

The tape library holds from 168 to 630 tape cartridges. The robot contained in the CTL700 tape library is responsible for loading and unloading the tape cartridges into the tape drives as tapes are requested by the system.

CTL700 Interface Components

A tape drive housed in the CTL700 Tape Library communicates with a NonStop server through a copper SCSI cable. Refer to [SCSI Cables](#) on page B-3 for SCSI cable part numbers.

Connection supported for Tape Drives in a CTL700 Tape Library

You can attach a tape drive to a NonStop S-series server using one of these SCSI ports, depending on your type of server.

	CT9840FC-1	CT9840-1	5259	N1521A	CT9841FC-1
ServerNet/DA	G06.16	G06.06	G06.14	G06.21	G06.16
IOMF 2 CRU	G06.16	G06.11	G06.14	G06.21	G06.16
PMF CRU	G06.16	G06.14	G06.14	G06.21	G06.16

You can attach these tape drives to a NonStop NS-series server using the Fibre Channel ServerNet Adapter (FCSA).

	CT9840FC-1	CT9840-1	5259	M8503	N1521A	CT9841FC-1
FCSA	H06.03	H06.03	H06.03	H06.03	H06.03	H06.03

Note. When attaching a CT9840-1, N1521A, or a 5259 tape drive to a NonStop NS-series server, a M8201 Fibre Channel to SCSI router must be used.

Library for the NonStop S-Series Server

The section covers:

[Supported Connections](#)

[8-1](#)

[Adding the Control Path and the Data Path](#)

[8-2](#)

Supported Connections

You can attach the CTL700 tape library (control path and data path) to a NonStop S-series server using one of the following:

- ServerNet/DA
- IOMF 2 CRU
- PMF CRU

Note. The control path is used to control the robot and the data path is used to control the tape drive(s).

Adding the Control Path and the Data Path

ServerNet/DA

To add the control path to the server configuration database, use the SCF ADD SCSI command. Use the SCF ADD TAPE command to add the data path. Before issuing these commands, check that the tape drive(s) and tape library are installed properly.

To add the control path:

```
-> SCF
-> ADD SCSI $CTL700, SENDTO STORAGE, PRIMARYLOCATION
(1,1,51), PRIMARYSAC 1, SCSIID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START SCSI $CTL700
-> STATUS SCSI $CTL700, DETAIL
```

To add the data path:

```
-> SCF
-> ADD TAPE $TAPE0, SENDTO STORAGE, LOCATION (1,1,51), SAC
1, DEVICEID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START TAPE $TAPE0
-> STATUS TAPE $TAPE0, DETAIL
```

For complete details about the ADD and STATUS commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

PMF CRU

To add the control path to the server configuration database, use the SCF ADD SCSI command. Use the SCF ADD TAPE command to add the data path. Before issuing these commands, check that the tape drive(s) and tape library are installed properly.

To add the control path:

```
-> SCF
-> ADD SCSI $CTL700, SENDTO STORAGE, PRIMARYLOCATION
(1,1,50), SCSIID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START SCSI $CTL700
-> INFO SCSI $CTL700, DETAIL
```

To add the data path:

```
-> SCF
-> ADD TAPE $TAPE0, SENDTO STORAGE, LOCATION (1,1,50),
DEVICEID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START TAPE $TAPE0
-> STATUS TAPE $TAPE0, DETAIL
```

In this example:

- The LOCATION attribute specifies the location (group, module, and slot) of the PMF CRU (adapter) to which the device is attached.
- The DEVICEID attribute shows the device ID that is configured for the device. This ID must match the SCSI ID that is physically set in the device.
- The PRIMARYCPU attribute specifies the processor in which the primary tape process should execute.
- The BACKUPCPU attribute specifies the processor in which the tape process starts its backup process.

For more information on the ADD and STATUS commands, see the *SCF Reference Manual for the Storage Subsystem*.

This section covers:

Using SCF With a Tape Drive or Tape Library	9-1
Using BACKUP and RESTORE	9-7
Using Labeled and Unlabeled Tapes	9-10
Controlling Data Compression	9-12
Programming and Configuration Considerations	9-17

Using SCF With a Tape Drive or Tape Library

Use the Subsystem Control Facility (SCF) to perform various maintenance operations on tape drives and other peripheral devices.

Checking the Status of the Tape Devices

Use the SCF STATUS command to display current status information about an object.

STATUS Command Syntax

The syntax for the STATUS command is:

```
STATUS [ /OUT file-spec/ ] [ object-spec ]  
[ ,DETAIL ]  
[ ,SEL state ]
```

OUT *file-spec*

Directs all SCF output generated for this command to the specified file.

DETAIL

Specifies that all status information should be displayed. If DETAIL is omitted, a single line of data is returned for each object name.

SEL *state*

Specifies that information should be displayed only for objects that are in the specified state.

Object-spec

Specifies one of the following combinations of object type and object name:

Object Type	Object Name
SCSI	<i>\$device-name</i>
SCSI	<i>\$device-name-path</i>
SUBSYS	<i>\$sto-mgr</i>
TAPE	<i>\$tape-name</i>

Wild-card characters are supported.

STATUS SCSI Command

This subsection describes the STATUS SCSI command for Open SCSI devices. The command syntax is:

```
STATUS SCSI $ device-name [ -P | -B ]
```

\$ device-name

specifies the name of the Open SCSI I/O process.

-P | -B

specifies whether the path is the primary (-P) or the backup (-B).

DETAIL

returns all status information.

Examples Using STATUS SCSI

These examples illustrate the STATUS SCSI command:

- To display the status of all Open SCSI devices on the system, type:
-> STATUS SCSI \$*
- To display the summary status of the Open SCSI device \$DEV00, type:
-> STATUS \$DEV00
- To display the detailed status of the Open SCSI device \$DEV00, type:
-> STATUS \$DEV00, DETAIL
- To display the summary status of the backup path of the Open SCSI device \$SD00, type:
-> STATUS \$SD00-B

STATUS TAPE Command

This subsection describes the details about the STATUS TAPE command. The command syntax is:

```
STATUS TAPE $tape name
```

Examples using STATUS TAPE

The following examples illustrate the STATUS TAPE command:

- To display the summary status of all tape drives starting with \$TAPE, type:
-> STATUS TAPE \$TAPE*
- To display the detailed status of the tape cartridge \$TAPE0, type:
-> STATUS \$TAPE0, DETAIL

Bringing Up a Tape Drive Using SCF

START Command (Sensitive Command)

Use the SCF START command to initiate the operation of an object (make a stopped device accessible to user processes). Successful completion of the START command leaves the object in a STARTED state.

START Command Syntax

The syntax for the START command is:

```
START [ /OUT file-spec/ ] [ object-spec ]  
[ , DEBUG $ terminal-name ]  
[ , SEL state ]  
[ , SPECIAL ]
```

OUT *file-spec*

directs all SCF output generated (for this command) to the specified file

DEBUG *\$terminal-name*

specifies that the process is started in the debug mode against the terminal supplied in the command

SEL *state*

specifies that the command should be issued only to objects that are in the specified state

SPECIAL

specifies that the object starts in the SERVICING state, substate SPECIAL. To restart an object in the SERVICING state, issue a RESET command followed by a START command

object-spec

specifies one of the following combinations of object type and object name:

Object Type	Object Name
SCSI	<i>\$device-name</i>
SCSI	<i>\$device-name-path</i>
TAPE	<i>\$tape-name</i>

START SCSI Command

This subsection describes the START SCSI command. Use the START SCSI command to make a stopped Open SCSI device or path to an Open SCSI device accessible to user processes. The command syntax is:

```
START SCSI {$device-name | $device-name-path}
```

Wild-card characters are supported.

Examples Using START SCSI

The following examples illustrate the START SCSI command:

- To start all Open SCSI devices on the system (that are in the proper state to start), type:

```
->START SCSI $*
```

- To start the backup path to the Open SCSI device \$DEV0, type:

```
->START $DEV0-B
```

START SCSI Considerations

Before using the START SCSI command, consider the following:

- Use the SCF STATUS SCSI command to verify that an Open SCSI device has been started.
- If the START SCSI command is failing, see the *NonStop S-Series Hardware Support Guide* for troubleshooting ideas.

START TAPE Command

This subsection describes the START TAPE command. Use the START TAPE command to assign a tape drive to a specific NonStop system. The command syntax is:

```
START TAPE $tape-name
```

Wild-card characters are supported.

Examples using START TAPE

The following examples illustrate the START TAPE command:

- To start all tapes available on the system, type:

```
-> START TAPE $*
```

- To start \$TAPE0, type:

```
-> START $TAPE0
```

START TAPE Considerations

Before using the START TAPE command, consider the following:

- See [Section 8, Configuring the CTL700 Tape Library for the NonStop S-Series Server](#).
- If the tape process does not start, use the SCF RESET TAPE, FORCED command prior to starting the tape drive.

Bring Down a Cartridge Tape Drive

STOP Command (Sensitive Command)

Use the SCF STOP command to terminate access to a storage device in an orderly manner. This means that the device isn't stopped until current activity ends. When the STOP command finishes, configured devices are left in a STOPPED state, substate DOWN. The devices remain in the system configuration database.

When the last path to a device is stopped, an implicit refresh operation is also performed. This is a general cleanup operation so that the device does not have any changed buffers or file control blocks outstanding.

STOP Command Syntax

The syntax for the STOP command is:

```
STOP [ /OUT file-spec/ ] [object-spec
]
[ , FORCED ]
[ , SEL state ]
```

OUT *file-spec*

directs all SCF output generated for this command to the specified file.

FORCED

specifies that the command should be executed without any interaction with the user, even if files are open on the device. SCF does not prompt the operator for confirmation.

SEL *state*

specifies that the command should be applied only to objects that are in the specified state.

object-spec

specifies one of the following combinations of object type and object name

Object Type	Object Name
SCSI	<i>\$device-name</i>
SCSI	<i>\$device-name-path</i>
TAPE	<i>\$tape-name</i>

Wild-card characters are supported.

STOP SCSI Command

This subsection describes the STOP SCSI command. The STOP SCSI command stops access to the specified Open SCSI device. The command syntax is:

```
STOP SCSI {$device-name | $1dev} [ -P
| -B ]
```

\$device-name* | *\$1dev

specifies the name or logical device number of the device.

-P | -B

specifies whether the path being stopped is the primary (-P) or backup (-B).

Wild-card characters are supported.

Examples Using STOP SCSI

The following examples illustrate the STOP SCSI command:

- To stop access to the backup path of the Open SCSI device \$DEV1, type:
-> STOP \$DEV1-B
- To stop access to all paths of the Open SCSI device \$DEV00, type:
-> STOP \$DEV00

STOP TAPE Command

The STOP TAPE command stops access to the specified tape drive.

STOP TAPE { <i>\$tape-name</i> <i>\$ldev</i> }
--

\$tape-name | *\$ldev*

Specifies the name or logical device number of the tape device.

Example

To stop access to all tape drives starting with \$TAPE, type:

-> STOP TAPE \$TAPE*

Using BACKUP and RESTORE

BACKUP and RESTORE are two of the most commonly used utilities for moving files between a NonStop system and tapes. You can use BACKUP to copy disk files to magnetic tape on a regular basis. If one or more disk files are lost or destroyed, you can use RESTORE to replace the lost files from tape.

To begin a BACKUP or RESTORE operation when using the tape library, a cartridge must be loaded into one of the drives contained within the tape library. For operations requiring a single cartridge, the tape drive writes to or reads from the tape. Then the robot unloads the cartridge (unless the NOUNLOAD option was specified) and loads the next requested tape label cartridge.

Using Multiple Cartridges

For BACKUP or RESTORE operations requiring multiple cartridges, the system issues a mount request that the robot receives via the server, and the new cartridge is loaded. See the following subsections for examples.

For more information on the BACKUP and RESTORE utilities, refer to the *Guardian Disk and Tape Utilities Reference Manual*.

Backing Up Disk Files to Tape

The following example copies all files from the \$DISK1.USER2 subvolume to the tape on the tape drive name \$TAPE1. The NOPROMPT option instructs the host system not to prompt the user before writing to each tape. This option is useful when the backup requires more than one cartridge, and the process utilizes a label tape environment:

```
->BACKUP $TAPE1, $DISK1.USER2.*,NOPROMPT
```

Using Labeled Tapes

If labeled tapes are being used, tape DEFINE with BACKUP and RESTORE commands must be used. A tape DEFINE specifies information about a tape file, such as the label type, tape density, and expiration date of the data on the tape. The following example specifies a CLASS TAPECATALOG DEFINE named =BACK. The BACKUP command copies all the files on the \$DATA volume to tape.

```
-> ADD DEFINE =BACK, CLASS TAPECATALOG, LABELS BACKUP&
-> USE OUT, CATALOG OFF
-> BACKUP =BACK, $DATA.*.*,LISTALL, NOPROMPT
```

- The LISTALL option lists the names of all files backed up.
- The NOPROMPT option instructs BACKUP not to prompt the user before beginning to write on each tape, but to begin when it detects the tape drive is ready.

For more information about labeled-tape processing, see [Using Labeled and Unlabeled Tapes](#) on page 9-10. For more information on tape DEFINES, see:

- *Guardian User's Guide*
- *Guardian Disk and Tape Utilities Reference Manual*
- *DSM/Tape Catalog User's Guide*

BACKUP Requiring Multiple Cartridges

For backups that require more than one cartridge tape, the robot starts with the cartridge that was requested to begin the backup process. If the BACKUP command includes the NOPROMPT option, the robot loads additional tapes sequentially without prompting the operator.

For example, if a BACKUP command that requires three cartridges is issued, the robot loads the cartridges requested in sequential order. The robot unloads the tape from the drive as the BACKUP process finishes and then loads the next cartridge.

Note. Cartridges are loaded in random slot order. The robot tracks the inventory of tape cartridges by label.

If a BACKUP operation requires additional cartridges and the requested cartridge is not in the tape library, the cartridges already written must be removed (Dismount, Eject), and the requested tape cartridge must be loaded into the CAP.

Restoring Tape Files to Disk

Use the RESTORE utility to copy files from magnetic tape to disk. The following example restores the contents of \$TAPE to a specified subvolume on \$DISK1 located within the same system:

```
-> RESTORE $TAPE, $DISK1.*.*, NOPROMPT
```

Note. When the restore operation requires multiple cartridges, the NOPROMPT option prevents user prompts between tapes. The restore operation continues when the tape drive is ready and the robot loads the next requested tape.

Viewing the Contents of a Tape

The RESTORE utility allows the contents of a labeled or unlabeled cartridge tape before restoring files to disk to be viewed. This example instructs the RESTORE utility to verify the tape on drive \$TAPE0, list the files without writing the tape to disk, and leaves the tape online so that a RESTORE process can be started without remounting the tape:

```
-> RESTORE $TAPE0, *.* , VERIFYTAPE, LISTONLY, NOUNLOAD
```

Using the BLOCKSIZE Option

Larger BLOCKSIZE attribute values can be used on systems that have installed a D30 or later version of the RESTORE utility. Larger BLOCKSIZE values can improve BACKUP performance by increasing the size of data records written to tape. The BLOCKSIZE option specifies the number of 1024-byte increments (blocks) in each record.

When using larger block sizes, make sure all tape drives and systems that will read the tape support the BLOCKSIZE specified.

Before using BLOCKSIZE values larger than 28, consider this:

- A tape that was backed up with a BLOCKSIZE larger than 28 can be restored only on a system using a D30 or later version of RESTORE on a tape drive that supports the larger block transfers.
- Expanded networks do not support BLOCKSIZE values larger than 28.

For more information about the BLOCKSIZE option, refer to the *Guardian Disk and Tape Utilities Reference Manual*.

Using the NOUNLOAD Option

The NOUNLOAD option directs the BACKUP utility to rewind the final tape and leave it online in the drive when the BACKUP process is completed. If the NOUNLOAD option in the BACKUP command is not specified, the robot returns the last cartridge tape to its slot within the tape library when the drive is finished writing to the tape. The robot then loads the next cartridge requested.

```
-> BACKUP $TAPE1, $MYDISK.MYVOL.*, NOUNLOAD
```

Using Labeled and Unlabeled Tapes

NonStop systems support two standard tape-label formats:

- ANSI
- IBM-MVS

Note. Because they can be cataloged and offer security features for protecting data, you should use labeled tapes with the 9840 tape drive.

Using the MEDIACOM Utility for Labeled-Tape Operation

MEDIACOM is the utility for managing labeled-tape operations. MEDIACOM replaces TAPECOM and provides the operator interface to the Distribute Systems Management (DSM)/Tape Catalog.

Use MEDIACOM commands to:

- Label new tapes and catalog them
- Handle tape mount requests
- Manage the use of uncataloged tapes
- Create scratch tapes

Getting More Information About Labeled-Tape Processing

For more information about...	Read...
Enabling labeled-tape processing	SCF Reference Manual for the Storage Subsystem
Managing labeled- tape processing	Guardian User's Guide
MEDIACOM and tape-label formats	DSM/Tape Catalog Operator Interface (MEDIACOM) Manual
BACKUP utility, RESTORE utility, or TAPECOM utility	Guardian Disk and Tape Utilities Reference Manual
FUP utility	File Utility Program (FUP) Reference Manual

Setting Up Labeled-Tape Operations Using SCF

If you plan to use labeled-tape operations, use the ALTER SUBSYS command to set this option:

- To turn on labeled-tape processing, enter at a TACL prompt:

```
-> SCF
-> STOP TAPE $* (Stops all tape operation)
-> ALTER $ZZSTO, LABELTAPE ON
-> START TAPE $*
-> EXIT
-> ZSERVER /NAME $ZSVR, NOWAIT, CPU primary-cpu / backup-cpu
```
- To turn off labeled-tape processing, at a TACL prompt:

```
-> STOP $ZSVR (Stops the tape server process $ZSVR)
-> SCF (Starts SCF)
-> STOP TAPE $* (Stops all tape operation)
-> ALTER $ZZSTO, LABELTAPE OFF
-> START TAPE $*
```

For complete details about the ALTER SUBSYS command, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

Controlling Data Compression

Data compression is a standard feature on the 9840 and 5259 tape drives. The tape drives write uncompressed data (unless compression mode is turned on). When activated for the tape drives, compression allows the drives to store up to three times as much data on a cartridge tape. However, the amount of compression varies with the data being written. Typically cartridge capacities can be expected to triple with the 9840 and 5259 tape drives.

Note. The system does not detect any difference in writing or reading compressed or uncompressed data. A disk file of 200 kilobytes written to tape in compressed mode is still a 200-kilobyte file on the tape, but it consumes less tape than the same file with uncompressed data.

Table 9-1. Methods for Controlling Data Compression

Method	Description
MEDIACOM	The MEDIACOM ALTER MEDIADEFS command sets a systemwide default.
The CLASS TAPECATALOG DEFINE command	The CLASS TAPECATALOG DEFINE can specify the compression default for one job. (It overrides the current systemwide default.)
The SETMODE 162 procedure call	The SETMODE 162 procedure call can specify the compression mode for one write command. (It overrides the current system wide default.)

Using MEDIACOM to Set the Systemwide Compression Default

MEDIACOM is the operator interface to the Distributed Systems Management (DSM)/Tape Catalog.

The compression attribute of the ALTER MEDIADEFS command has two possible settings: COMPRESSION IDRC and COMPRESSION OFF. The default setting is COMPRESSION OFF. When COMPRESSION IDRC is specified, compression mode is turned on for the 9840 tape drive.

Note. Only super-group users (user ID 255,n) can issue the ALTER MEDIADEFS command.

To check and set the systemwide compression default specification:

1. Enter MEDIACOM at the TACL prompt:

```
-> MEDIACOM
MEDIACOM-T6028D42 (18DEC98)
MC>
```

2. Display the current system setting for compression:

```
MC> INFO MEDIADEFS

Support Level          NOCATALOG
Automatic              OFF
Compression            OFF
MC>
```

Compression OFF means that by default, compression is not attempted during a write to a scratch tape volume.

3. Set compression on or off. For example:

a. To set compression on by default:

```
MC> ALTER MEDIADEFS, COMPRESSION IDRC
```

b. To set compression off by default:

```
MC> ALTER MEDIADEFS, COMPRESSION OFF
```

4. Enter EXIT to exit MEDIACOM and return to the TACL prompt:

```
MC> EXIT
```

```
->
```

For more information about MEDIACOM and the ALTER MEDIADEFS command, see the *DSM/Tape Catalog Operator Interface (MEDIACOM) Manual*.

Using DEFINE to Override the System Compression Default

The systemwide compression default specification set by the MEDIACOM ALTER MEDIADEFS command applies to the labeled and unlabeled tapes. After the default specification is set, the drive always writes using the default setting. To override the default specification for a specific job, use a CLASS TAPECATALOG DEFINE.

A CLASS TAPECATALOG DEFINE is a named set of attributes and values that specify information about a tape file. If labeled tape is used, a CLASS TAPECATALOG DEFINE must be created for each tape file to be accessed before the tape can be used.

Using a CLASS TAPECATALOG DEFINE

There are two types of tape DEFINES:

- CLASS TAPE DEFINES
- CLASS TAPECATALOG DEFINES

If the DSM/Tape Catalog software system is being used, a CLASS TAPECATALOG DEFINE must be used. A CLASS TAPECATALOG DEFINE is similar to a CLASS TAPE DEFINE, but the CLASS TAPECATALOG DEFINE has two additional attributes:

Attribute	Options
CATALOG	ON or OFF
COMPRESSION	IDRC or OFF

```
CATALOG { ON | OFF }
```

Requests the services of the DSM/Tape Catalog (which might not be installed on the system). Specify OFF to use the CLASS TAPECATALOG DEFINE template without using DSM/Tape Catalog. Specify ON to use the DSM/Tape Catalog.

COMPRESSION { ON | OFF }

Overrides the systemwide default compression specification on a job-by-job basis for any tape in the tape drive. Compression can be set ON or OFF.

Notes.

- After executing a CLASS TAPECATALOG DEFINE, the system returns to the systemwide default specification for the next job.
- If the COMPRESSION attribute is not specified in the DEFINE, the system uses the default compression specification set by the MEDIACOM ALTER MEDIADEFS command.
- If no default specification was set using the ALTER MEDIADEFS command, the default compression specification for any tape on the tape drive is OFF.
- Applications specifying a CLASS TAPE DEFINE always use the systemwide default specification for compression because there is no COMPRESSION attribute for a CLASS TAPE DEFINE.

Examples

All examples assume that DSM/TC will not be used. Examples 1 and 2 show CLASS TAPECATALOG DEFINES specified for BACKUP operations.

Example 1

This example for a labeled tape specifies a CLASS TAPECATALOG DEFINE named =BACK with compression on (IDRC). The USE OUT attribute specifies to write the file to tape. The BACKUP command copies all the files in the \$DATA volume to tape. The LISTALL option lists the names of all files backed up, and the NOUNLOAD option directs BACKUP to rewind the final tape and leave it online when the BACKUP operation is completed.

```
->ADD DEFINE =BACK, CLASS TAPECATALOG, LABELS BACKUP,
& CATALOG OFF, COMPRESSION IDRC, USE OUT
->BACKUP =BACK, $DATA.*.*, LISTALL, NOUNLOAD
```

Example 2

This example for an unlabeled tape specifies a CLASS TAPECATALOG DEFINE named =UNLABEL with compression off. For unlabeled tape, a device must be specified in the DEFINE (in this example, DEVICE \$TAPE1). Because it is an unlabeled tape, the LABELS attribute has the value OMMITED.

```
->ADD DEFINE =UNLABEL, CLASS TAPECATALOG, & LABELS
OMMITED, CATALOG OFF, DEVICE $TAPE1, & COMPRESSION OFF
->BACKUP =UNLABEL, $DATA.*.*, LISTALL, NOUNLOAD
```

Example 3

This example for an unlabeled tape shows a BACKUP command that does not use a DEFINE. In this case, the tape drive writes data using the systemwide default compression specification.

```
->BACKUP $TAPE, $DATA.*.*
```

Example 4

This example for a labeled tape shows a File Utility Program (FUP) command that uses a CLASS TAPECATALOG DEFINE NAMED =FUPOUT to turn compression on (IDRC). The USE OUT attribute specifies to write the file to tape.

The FUP COPY command copies the contents of FILE1 record-by-record to volume IBM001.

```
->ADD DEFINE =FUPOUT, CLASS TAPECATALOG, LABELS IBM, &
  VOLUME IBM001, COMPRESSION IDRC, USE OUT, CATALOG OFF
->FUP COPY FILE1, =FUPOUT
```

For More Information

For more information about how to create DEFINES and use them in labeled tape processing, see the *Guardian User's Guide* and *the Guardian Disk and Tape Utilities Reference Manual*. For information on how to specify CLASS TAPECATALOG DEFINES, see the *DSM/Tape Catalog User's Guide*. For more information on using the BACKUP and FUP utilities, see the *Guardian Disk and Tape Utilities Reference Manual* and the *File Utility Program (FUP) Reference Manual*.

Using SETMODE 162 to Control Compression Mode

If you do not want the systemwide default compression specification (default is normally compression off), you can use the SETMODE 162 procedure call to set compression mode on or off.

Setting	param1 Value
No data compression	1
Data compression	2

Considerations:

- Changes to compression using SETMODE 162 are allowed only at the beginning of tape (BOT). Otherwise, the tape drive returns an error.
- BACKUP and FUP utilities do not support SETMODE operation.

Programming and Configuration Considerations

Choosing Block Size

56 kilobytes is the largest data record that can be created when writing to tape. However, if you want to create block sizes that can be read by most NonStop systems, tape drives and control units should not create data records larger than 32,767 bytes (32 kilobytes minus 1 byte).

For a detailed discussion of these limits as they relate to the BACKUP and RESTORE utilities, see [Using the BLOCKSIZE Option](#) on page 9-9.

Using a 9840Tape Drive for a Memory Dump

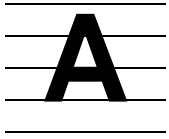
Dumping processor memory directly to tape is not supported for tape drives in a tape library. You can perform a memory dump to disk. Then use the BACKUP utility to copy the memory dump to tape. To perform a tape dump, use a tape drive for additional information on how to perform memory dumps, refer to the *NonStop S-Series Operations Guide*.

Using a Tape Drive for a Tape Boot or Tape Load

A tape boot or tape load should only be performed at the advice of service providers.

-
- △ **Caution.** Tape boot is a destructive function that destroys the files on the system disk. It destroys all information in the system configuration database including all configuration information about tapes, adapters, and more. The system image does not contain this information. If it is lost, many additional steps are required to restore the system to working order.
-

For more information refer to the *NonStop S-Series Operations Guide*.



Components for the CTL700 Tape Library

This section covers:

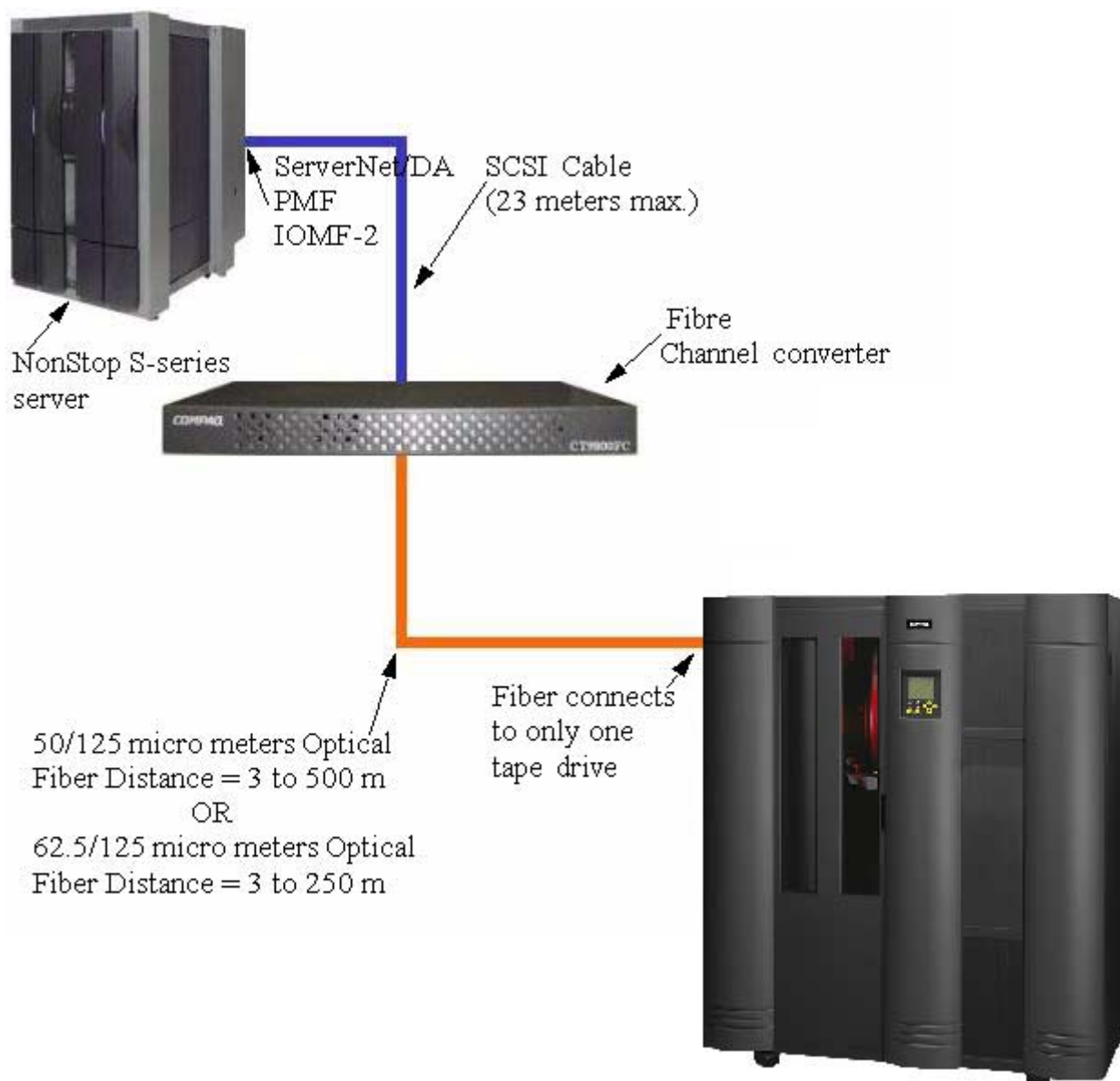
[Connecting the CT9800FC Fibre Channel Converter to a CT9840FC-1/CT9841FC-1 Tape Drive](#) [A-2](#)

[Connecting the CT9800FC Fibre Channel Converter to the CTL7FC Fibre Channel Interface Card](#) [A-7](#)

Connecting the CT9800FC Fibre Channel Converter to a CT9840FC-1/CT9841FC-1 Tape Drive

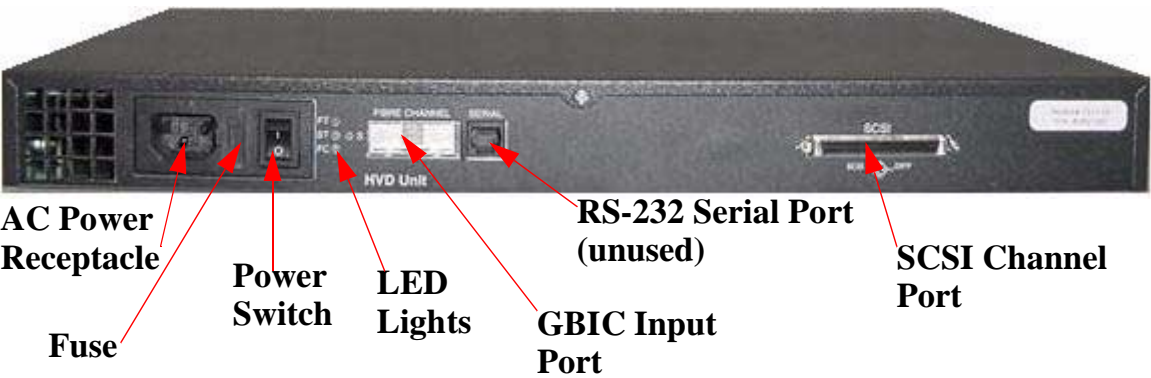
[Figure A-1](#) shows an example of how a CT9800FC Fibre Channel converter is configured with a CT9840FC-1/CT9841FC-1 tape drive inside of a CTL700 tape library and a NonStop S-series server.

Figure A-1. Example of the Fibre Channel Converter Configuration with a CT9840FC-1/CT9841FC-1 Tape Drive Inside of a CTL700 Tape Library and a NonStop Server



[Figure A-2](#) is an illustration of where the rear components are located on the CT9800FC Fibre Channel converter.

Figure A-2. Rear Panel Components



Installing the SCSI Interface Cable

1. Before installing the 68-pin SCSI cable from the Fibre Channel converter to the server, make sure that the tape drive and the Fibre Channel converter are both powered off. Refer to [Appendix B, Multimode Fiber-Optic Cables](#) for SCSI cable part numbers.
2. Connect the 68-pin SCSI cable to the SCSI channel port on the converter.
3. Connect the other end of the 68-pin SCSI cable to a supported SCSI port on a NonStop S-series server.

Table A-1. Connections Supported for the CT9800FC Fibre Channel Converter

Server	ServerNet/DA	IOMF CRU	IOMF 2 CRU	PMF CRU
S7000	YES	NO	NO	NO
S7400	YES	NO	YES	NO
S70000	YES	NO	YES	NO
S72000	YES	NO	YES	NO
S74000	YES	NO	YES	YES
S76000	YES	NO	YES	YES
S86000	YES	NO	YES	YES

Installing Fiber Interface Cables

To Install Fiber Cables

Connect one end of the fiber cable to port A on the tape drive, and the other end of the cable to the GBIC on the CT9800FC Fibre Channel converter. Refer to [Appendix B, Multimode Fiber-Optic Cables](#) for cable part numbers.

Figure A-3. Location of Fibre Channel Port on the CT9840FC-1



Figure A-4. Location of the GBIC on the CT9800FC Fibre Channel Converter



After you have installed the fiber cable, power on both the CT9840FC-1 tape drive and the CT9800FC Fiber Channel converter. **The CT9840FC-1/CT9841FC-1 tape drive must be powered on first.**

Powering on the Tape Drive and the Fibre Channel Converter

1. Make sure that the power cords are fully seated into the AC power receptacles on both the tape drive and the Fibre Channel converter.
2. Attach the male end of the power cords to two separate power outlets.
3. Press the power switch to 1 on the CT9840FC-1/CT9841FC-1 tape drive.
4. Press the power switch to 1 on the CT9800FC Fiber Channel converter.
5. Verify that both of the devices power on.

Note. The CT9840FC-1/CT9841FC-1 tape drive must be powered on first.

▲ **WARNING.** The CT9840FC-1/CT9841FC-1 tape drive and the CT9800FC Fibre Channel converter do not have protection against lightning surges. For this reason, those customers located in high risk areas should use external surge protection rated for use in their location and be able to handle the power demand of the Fibre Channel converter enclosure.

If connectivity is not established, the FC green LED will not be illuminated on the converter as shown in [Figure A-5](#). You will need to check the fiber cable connections on both the tape drive and the Fibre Channel converter.

Figure A-5. FC LED Not Illuminated



If connectivity is established the FC green LED will be illuminated as shown in [Figure A-6](#).

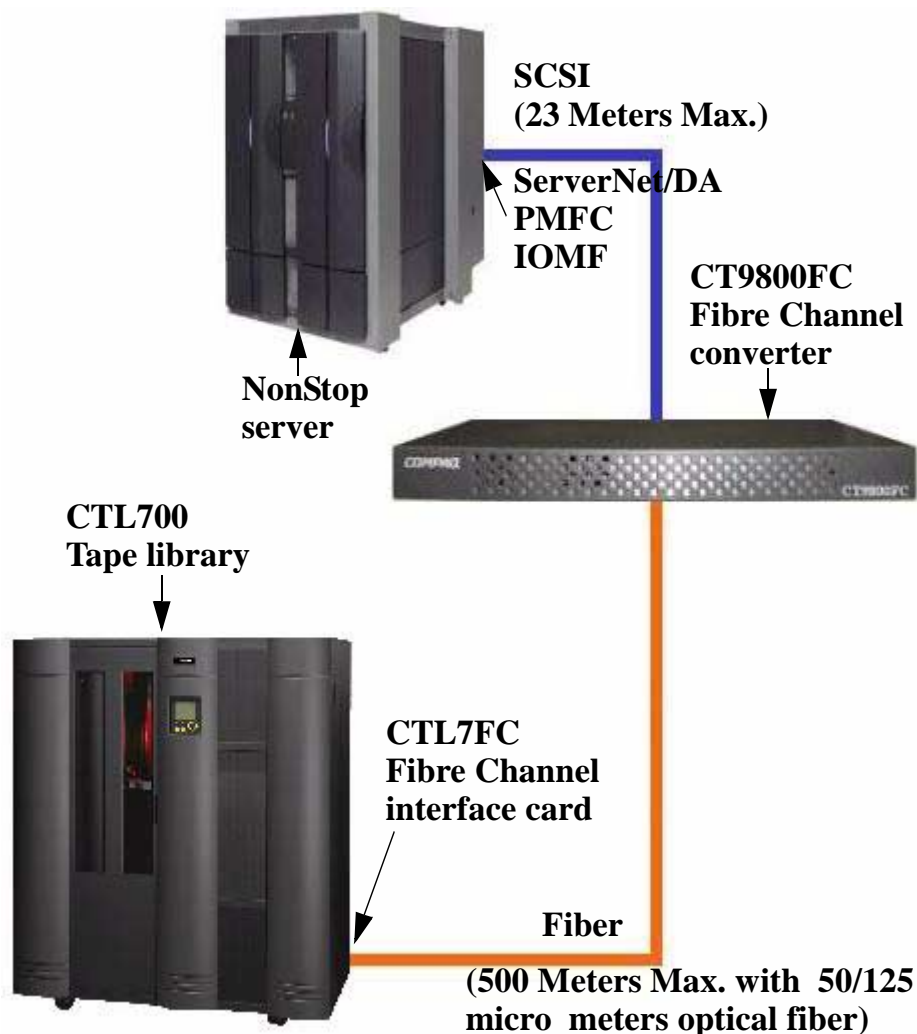
Figure A-6. FC LED Illuminated



Connecting the CT9800FC Fibre Channel Converter to the CTL7FC Fibre Channel Interface Card

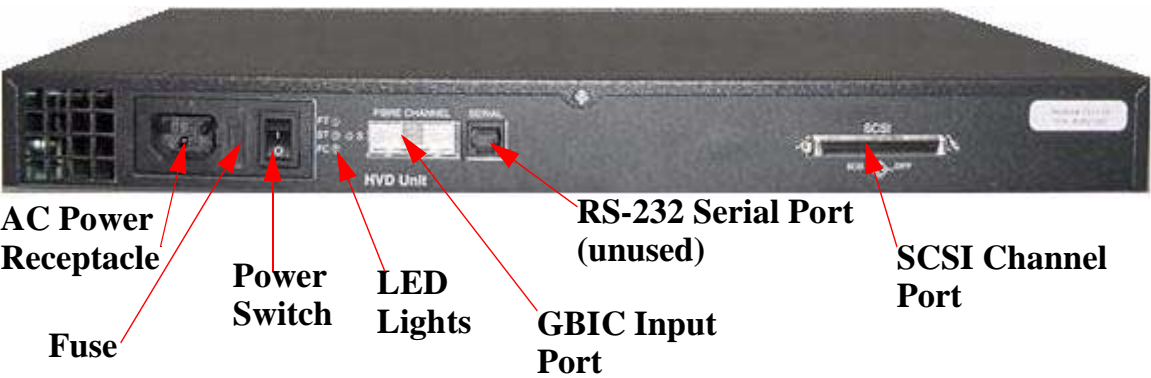
[Figure A-7](#) shows how a CT9800FC Fibre Channel converter is configured with a CTL700 tape library and a NonStop Himalaya server. The CTL7FC Fibre Channel interface card is located inside the front right access door of the CTL700 tape library. The example in [Figure A-7](#) is an illustration of how the converter is configured for the CTL700 tape library's control path.

Figure A-7. Example of the CT9800FC Fibre Channel Converter Configuration With a CTL700 Tape Library and a Nonstop Server



[Figure A-8](#) is an illustration of where the rear components are located on the CT9800FC Fibre Channel converter.

Figure A-8. Rear Panel Components



Installing the SCSI Interface Cable

1. Before installing the 68-pin SCSI Cable from the converter to the host, make sure that the tape library and the converter are both powered off. Refer to [Appendix B, Multimode Fiber-Optic Cables](#) for SCSI cable part numbers.
2. Connect the 68-pin SCSI Cable to the SCSI channel port on the converter.
3. Connect the other end of the 68-pin SCSI cable to a supported SCSI port on a NonStop S-series server.

Table A-2. Connections Supported for the CT9800FC Fibre Channel Converter

Server	ServerNet / DA	IOMF CRU	IOMF 2 CRU	PMF CRU
S7000	YES	NO	NO	NO
S7400	YES	NO	YES	NO
S70000	YES	NO	YES	NO
S72000	YES	NO	YES	NO
S74000	YES	NO	YES	YES
S76000	YES	NO	YES	YES
S86000	YES	NO	YES	YES

Installing Fiber Interface Cables

Connect one end of the fiber cable to the CTL7FC Fibre Channel interface card, and the other end of the cable to the GBIC on the CT9800FC Fibre Channel converter. Refer to [Appendix B, Multimode Fiber-Optic Cables](#) for cable part numbers.

Figure A-9. Location of the CTL7FC Fibre Channel Interface Card Inside the CTL700 Tape Library



Figure A-10. Location of the GBIC on the CT9800FC Fibre Channel Converter.



After you have installed the fiber cable, power on both the CTL700 tape library and the CT9800FC Fibre Channel converter. The tape library must be powered on first.

Powering on the CTL700 Tape Library and the Fibre Channel Converter

1. Check that the power cords are fully seated into the AC power receptacles on both the tape library and the Fibre Channel converter.
2. Attach the male end of the power cords to two separate power outlets.
3. Press the power switch to 1 “on position” on the CTL700 tape library.
4. Press the power switch to 1 “on position” on the CT9800FC Fibre Channel converter.
5. Verify that both of the devices power on.

Note. Remember that the CTL700 tape library must be powered on first.

▲ **WARNING.** The CT9800FC Fibre Channel converter and the CTL700 tape library does not have protection against lightning surges. For this reason, those customers located in high risk areas should use external surge protection rated for use in their location and be able to handle the power demand of the converter enclosure.

If connectivity is not established, the FC green LED will not be illuminated as shown in [Figure A-11](#) on page A-11. You will need to check the fiber cable connections on both the tape drive and the Fibre Channel converter.

Figure A-11. FC LED Not Illuminated



If connectivity is established the FC green LED will be illuminated as shown in [Figure A-12](#).

Figure A-12. FC LED Illuminated



B Multimode Fiber-Optic Cables

To connect each CT9840FC-1/CT9841FC-1 Fibre Channel tape drive to a NonStop S-series system, both a CT9800FC Fibre Channel converter with a multimode gigabit interface converter (GBIC) and a supported multimode short-wave fiber-optic cable are required.

Note. The Fibre Channel converter is shipped with a black multimode GBIC. Do not use a blue single-mode GBIC, such as those on a SCSI extender, to connect to a 9840 Fibre Channel tape drive. A GBIC is a transceiver that converts serial electric signals to serial optical signals and vice versa. A GBIC is used to interface a fiber optic system with an Ethernet system, such as Fibre Channel and Gigabit Ethernet.

Use a supported SCSI cable to connect a Fibre Channel converter to a PMF CRU NonStop S74000 or later, an IOMF 2 CRU, or a ServerNet D/A S-SAC. Use the supported multimode fiber-optic cable between the subscriber connector (SC) connector on the Fibre Channel converter to an SC connector on the tape drive. An SC is also known informally as a "Stick and Click" connector.

Note. Do not connect a 9840 Fibre Channel tape drive directly to a NonStop S-series system using a ServerNet D/A F-SAC.

Three types of multimode fiber-optic cables are supported for connection to CT9840FC-1 Fibre Channel tape drives:

- HP recommends using a 50/125 micron multimode fiber-optic cable with SC connectors on both ends. The maximum cable length supported is 500 meters. For distances greater than 250 meters, this type of cable is required. HP does not supply these cables, but they are available from fiber-optic cable vendors.
- The next choice is a 62.5/125 micron multimode cable, with dual SC connectors (product number 676Mx-x). The maximum cable length supported is 200 meters.
- The last choice is a 62.5/125 micron multimode fiber-optic cable (product number F9-x or F12-x). Use one of these cables only if you are replacing a 519x tape drive with a CT9840FC, and want to continue to use the F9-x or F12-x fiber-optic cables that are already installed in the building. The F12-x cables have an FDDI connector on one end and an SC connector on the other end. The F9-x cables have *Fiber distributed data interface* (FDDI) connectors on both ends. Therefore, you must use a converter cable and coupler to convert each FDDI connector to an SC connector. The maximum cable length supported is 250 meters.

Note. Do not use F12-500 or F9-500W cable with 9840 Fibre Channel tape drives or any customer-supplied 62.5/125 cable longer than 250 meters.

Two types of multimode fiber-optic cables are supported for connection to CT9841FC-1 Fibre Channel tape drives:

- HP recommends using a 50/125 micron multimode fiber-optic cable with SC/LC connectors on opposite ends. The maximum cable length supported is 500 meters. For distances greater than 250 meters, this type of cable is required. We do not supply these cables, but they are available from fiber-optic cable vendors.
- The next choice is a 62.5/125 micron multimode cable, with SC/LC connectors on opposite ends. The maximum cable length supported is 200 meters.

62.5/125 Multimode Fiber-Optic Cables (676x-x) With SC Connectors

Product No.	Part No.	Description
676MZ-010	427275-001	zip cord, 3 meter (9.8 ft.)
676MZ-016	427276-001	zip cord, 5 meter (16.4 ft.)
676MZ-033	427277-001	zip cord, 10 meter (32.8 ft.)
676MR-082	427278-001	ruggedized, 25 meter (82 ft.)
676MR-164	427279-001	ruggedized, 50 meter (164 ft.)
676MR-328	427280-001	ruggedized, 100 meter (328 ft.)
676MR-656	427281-001	ruggedized, 200 meter (656 ft.)

62.5/125 Multimode Fiber-Optic Cables (F9x or F12x)

Product No.	Part No.	Description
F12-01	U42296	FDDI to SC adapter cable set, which contains both a one meter cable - U33688 and coupler - U36332.
F12-CP	U36332	FDDI coupler

F9x Cables With FDDI Connectors

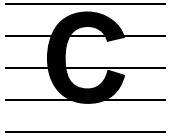
Product No.	Part No.	Description
F9-10W	T64351	10 meter (32.8 feet)
F9-25W	T64352	25 meter (82 feet)
F9-50W	T64353	50 meter (164 feet)
F9-100W	T64354	100 meter (328 feet)
F9-250W	T64355	250 meter (820 feet)

F12x Cables With FDDI Connectors and SC Connector

Product No.	Part No.	Description
F12-10	U33690	10 meter (32.8 feet)
F12-25	U33691	25 meter (82 feet)
F12-50	U33692	50 meter (164 feet)
F12-100	U33693	100 meter (328 feet)
F12-250	U33694	250 meter (820 feet)

SCSI Cables

Part No.	Description
424360-001	CBL:68 PIN, EXT, SCSI 1 meter (3.3 feet)
424361-001	CBL:68 PIN, EXT, SCSI 3 meter (9.8 feet)
424362-001	CBL:68 PIN, EXT, SCSI 15 meter (49.2 feet)
424917-001	CBL:68 PIN, EXT, SCSI 20 meter (65.7 feet)
424363-001	CBL:68 PIN, EXT, SCSI 23 meter (75.5 feet)



Requirements for the CT9841FC-1

For OSM support of the CT9841FC-1 tape drives, you need:

- G06.23 or later versions of OSM are required.
- CT9841FC-1 is supported on G06.16 through G06.22 by installing the G06.23 or later version of OSM, and the appropriate SPR's. See prerequisites SPR's for OSM in the "OSM Migration Guide" for G06.23 or later.

For CTL700 support of the CT9841FC-1 tape drive follow the instructions below:

The HP NonStop S-series server supports only FC-AL mode. Please configure the tape drive from the library control panel to the following settings:

- HARD ADDRESS "ENABLED"
- LOOP ID "005"

No other changes need to be made to the tape drive and/or the tape library.

For SF10v2 (Silo Media Manager) support of the CT9841FC-1 tape drive the following versions are needed:

- SF10v2 version is 6.05
- GUI version 6.0.1.22

Library for the NonStop NS-Series Server

This section covers:

[Fibre Channel ServerNet Adapter Connection](#) [D-1](#)

[Configuration](#) [D-1](#)

Fibre Channel ServerNet Adapter Connection

You can attach the CTL700 tape library (control path and data paths) to a NonStop NS-series server using a Fibre Channel ServerNet adapter (FCSA).

Note. The control path is used to control the robot and the data path is used to control the tape drives.

The control path and SCSI tape drives (CT9840-1, N1521A, and 5259) will need to be connected to a M8201 Fibre Channel converter before connecting to a FCSA on a NonStop NS-Series server.

For more information about the router, refer to the *M8201 Fibre Channel to SCSI Router Installation and User's Guide*.

All Fibre Channel tape drives (CT9840FC-1, CT9841FC-1, and M8503) connect directly to the FCSA on the NonStop NS-series server by using a fiber optic cable.

Configuration

Configuring SCSI Tape Drives

1. In SCF, issue this command:

```
SCF> ADD TAPE $tape, SENDTO STORAGE, LOCATION (group, module, slot), SAC sac-id, PORTNAME 64-bit-portname, LUN lun-id
```

Example:

```
SCF> ADD TAPE $TAPE1, SENDTO STORAGE, LOCATION (1,1,51), SAC 1, PORTNAME 100000E00C00F000,LUN 1
```

Note. LUN in SCF should be 1 for the tape drive that is on bus 0. Lun in SCF should be 3 for the tape drive that is on bus 1.

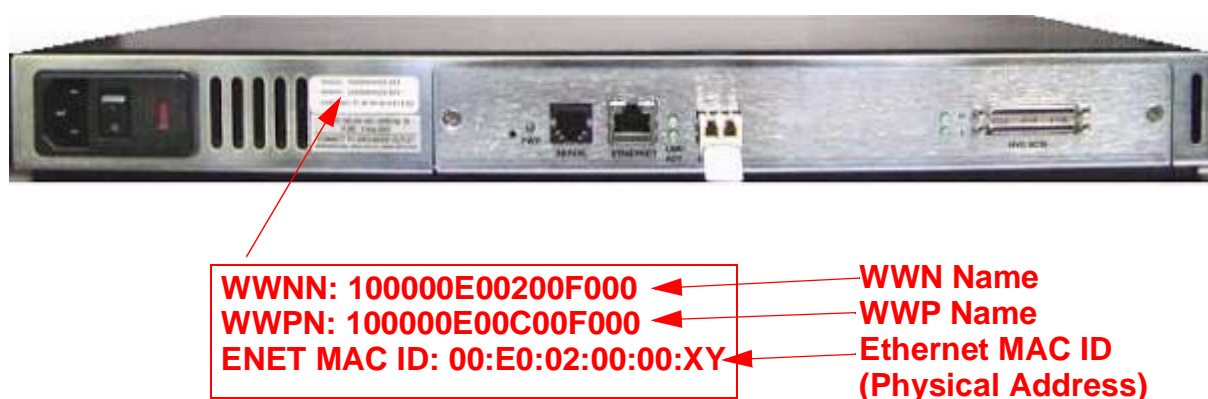
Note. PORTNAME in SCF corresponds to the WWP name of the router. This name is located on the back of the device. See [Figure D-1](#) on page D-2.

[Table D-1](#) shows the SCSI ID, router port number, and the LUN address for a tape drive.

Table D-1. Fibre Channel to SCSI Router LUN Mapping Table

DEVICE	SCSI ID	Router PORT	LUN ADDRESS
Tape Drive	5	0	LUN 1
Tape Drive	5	1	LUN 3

Figure D-1. Fibre Channel Router Rear View



- To start the tape drive on the server, issue this command in SCF:

```
SCF> START TAPE $tape
```

Example:

```
SCF> START TAPE $TAPE1
```

For complete details about the ADD and START commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

Configuring the Control Path

1. In SCF, issue this command:

```
SCF> ADD SCSI $scsi, SENDTO STORAGE, PRIMARYLOCATION (group,  
module, slot), PRIMARYSAC sac-id, PRIMARYPORTNAME 64-bit-  
portname, LUN lun-id
```

Example:

```
SCF> ADD SCSI $CTL700, SENDTO STORAGE, PRIMARYLOCATION  
(110,2,3), PRIMARYSAC 1, PRIMARYPORTNAME 100000E00D00F000,LUN  
0
```

Note. LUN in SCF should be 0 for the tape library that is on Bus 0. Lun in SCF should be 2 for the tape library that is on Bus 1.

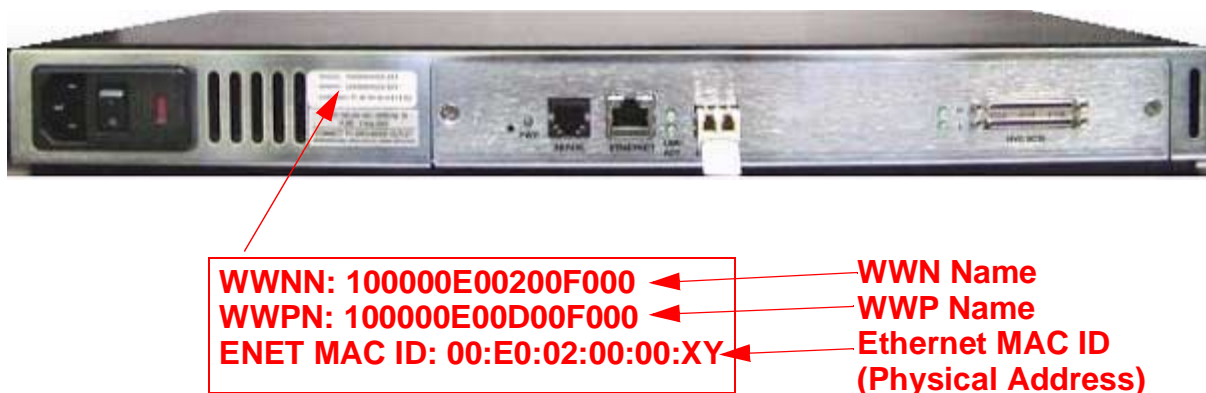
Note. PORTNAME in SCF corresponds to the WWP name of the router. This name is located on the back of the device. See [Figure D-2](#).

[Table D-2](#) shows the SCSI ID, router port number, and the LUN address for a tape library.

Table D-2. Fibre Channel to SCSI Router LUN Mapping Table

DEVICE	SCSI ID	Router PORT	LUN ADDRESS
Tape Library	3	0	LUN 0
Tape Library	3	1	LUN 2

Figure D-2. Fibre Channel Router Rear View



2. To start the tape library on the server, issue this command in SCF:

```
SCF> START SCSI $scsi
```

Example:

```
SCF> START SCSI $CTL700
```

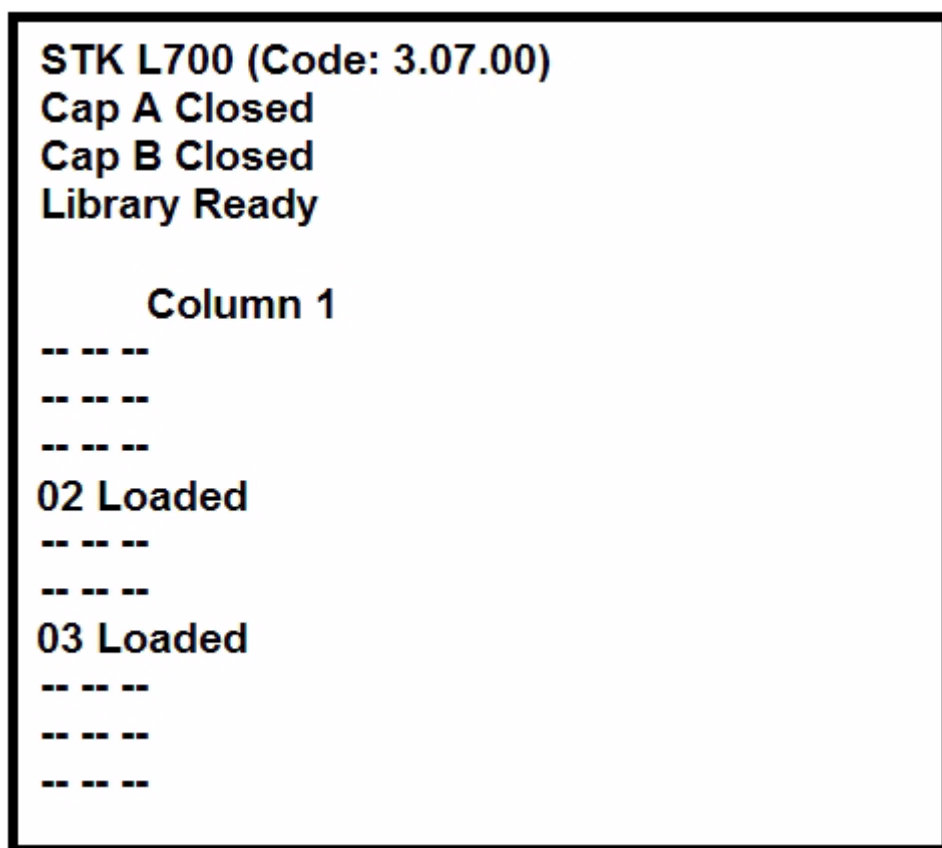
Configuring Fibre Channel Tape Drives

Follow steps 1-10 to navigate through the tape library's menu configuration to view the PORTNAME of the tape drive that you want to configure.

The purpose of viewing the tape drive's PORTNAME is because it will be added to the SCF configuration in step [11](#) on page D-9.

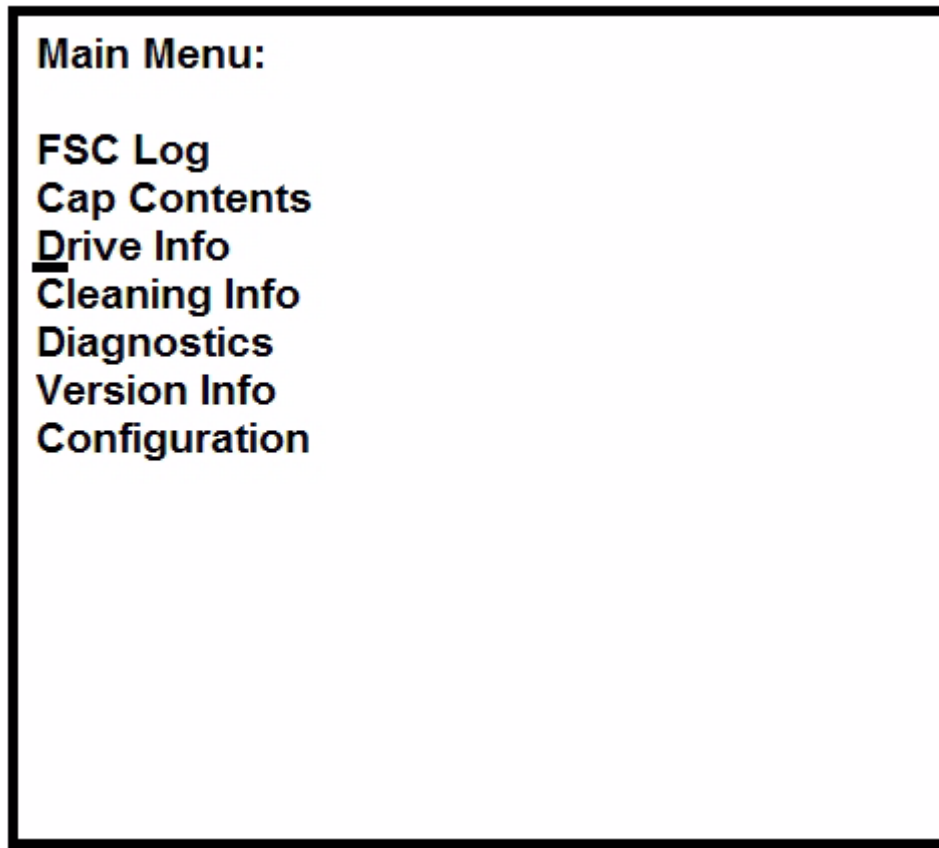
1. At the tape library's Menu screen, choose the column where the tape drive resides.
2. If the tape drive that you need to configure is in Column 1, press the up or down key on the control panel to view Column 1 as shown in [Figure D-3](#).

Figure D-3. View of Column 1



3. Press the Menu key on the control panel and the Main Menu will appear.
4. Scroll down to Drive Info on the Main Menu by using the down key on the control panel as shown in [Figure D-4](#).

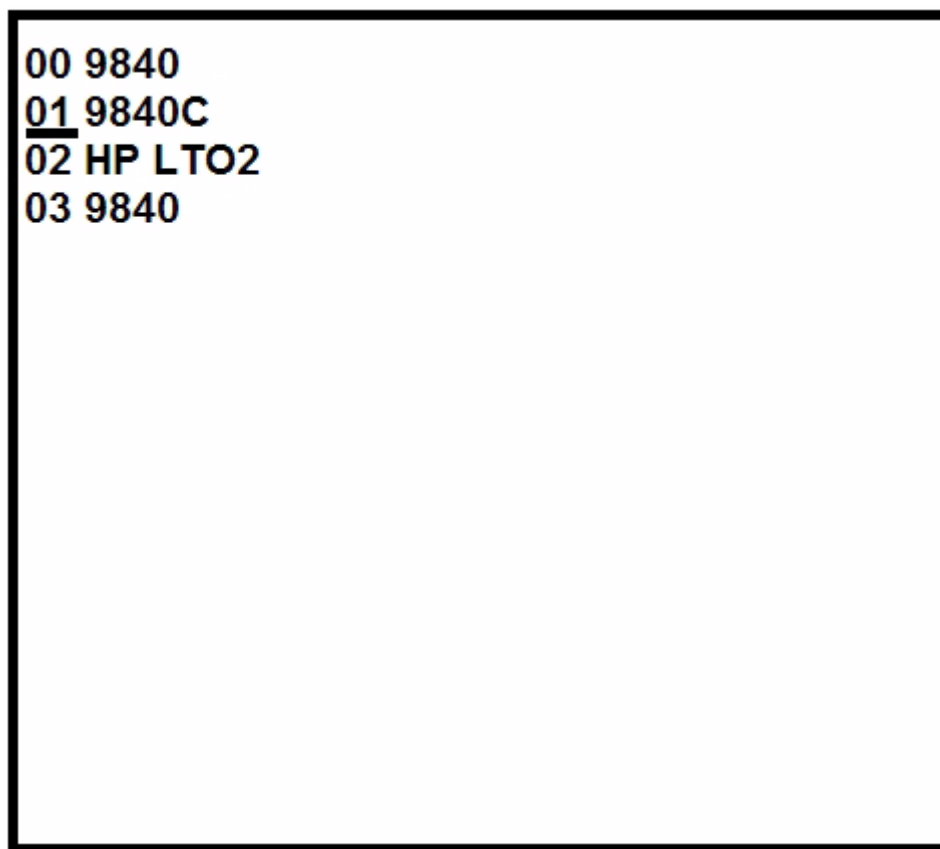
Figure D-4. Main Menu



-
5. Press the Select key on the control panel for Drive Info.
 6. Select the tape drive that you need to configure by using the up or down arrows on the control panel.

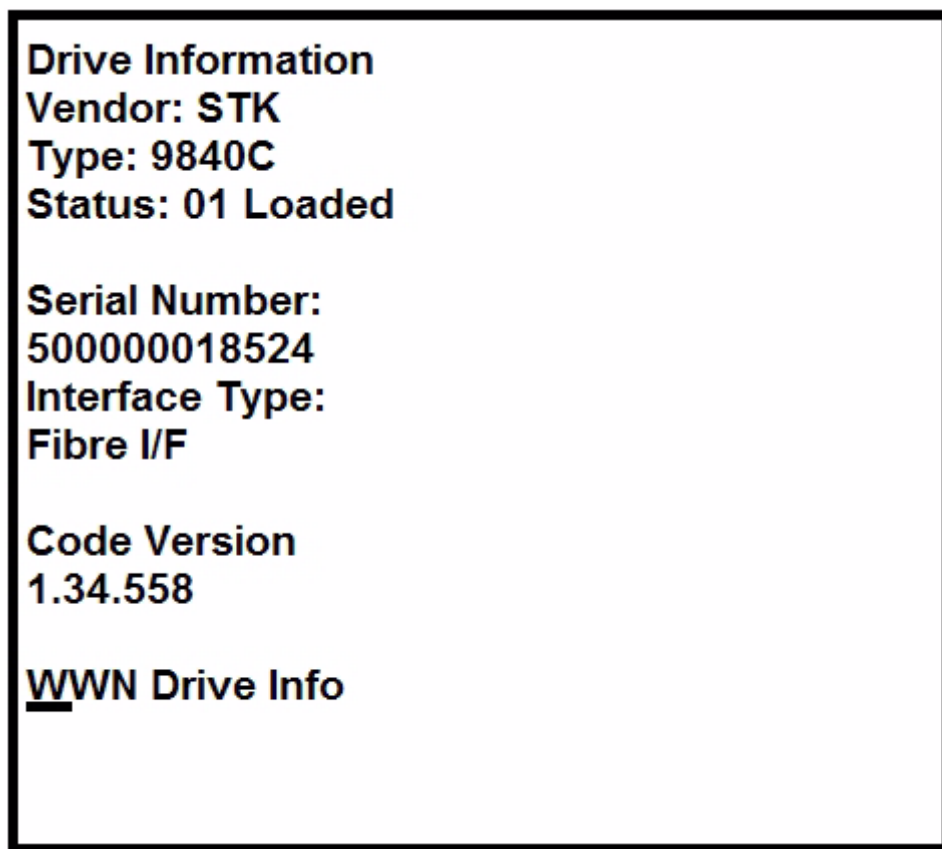
In this example we are going to select the 9840C tape drive. See [Figure D-5](#) on page D-6.

Figure D-5. Drive Info



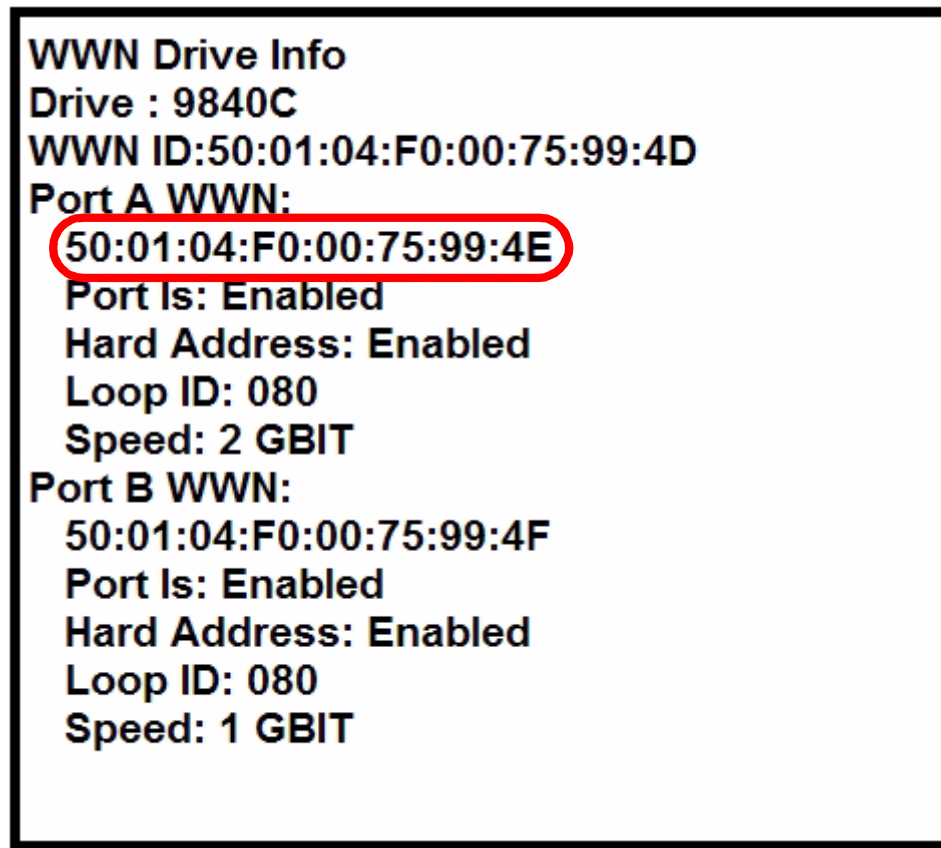
-
7. Press the Select key on the control panel and the Drive Information screen will appear as shown in [Figure D-6](#) on page D-7.

Figure D-6. Drive Information



-
8. Press the Select key on the control panel for WWN Drive Info, and the WNN Drive Information will appear as shown in [Figure D-7](#) on page D-8.

Figure D-7. WWN Drive Info



-
9. Choose the tape drive's port that the fiber cable is plugged into. In this example the fiber cable is plugged into Port A on the tape drive. The WWN for Port A is 500104F00075994E. This number will be used for the PORTNAME in Step 11.
 10. Press the Menu key on the control panel four times to exit the menu.

11. In SCF, issue this command:

```
SCF> ADD TAPE $tape, SENDTO STORAGE, LOCATION (group, module,  
slot), SAC sac-id, PORTNAME 64-bit-portname, LUN lun-id
```

Example:

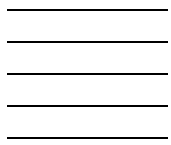
```
SCF> ADD TAPE $TAPE1, SENDTO STORAGE, LOCATION (110,2,3), SAC  
1, PORTNAME 500104F00075994E, LUN 1
```

12. To start the tape drive on the server, issue this command in SCF:

```
SCF> START TAPE $tape
```

Example:

```
SCF> START TAPE $TAPE1
```

Safety and Compliance

This section contains three types of required safety and compliance statements:

- Regulatory compliance
- Waste Electrical and Electronic Equipment (WEEE)
- Safety

Regulatory Compliance Statements

The following regulatory compliance statements apply to the products documented by this manual.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by Hewlett-Packard Computer Corporation could void the user's authority to operate this equipment.

Canadian Compliance

This class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Korea MIC Compliance

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Taiwan (BSMI) Compliance

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japan (VCCI) Compliance

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case the user may be required to take corrective actions.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parenthesis):

- EN55022 (CISPR 22)—Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11)—Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN60950 (IEC950)—Product Safety

Laser Compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.



WARNING: Use the controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- **Do not try to open the module enclosure. There are no user-serviceable components inside.**
 - **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**
 - **Allow only HP Authorized Service technicians to repair the module.**
-

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

SAFETY CAUTION

The following icon or caution statements may be placed on equipment to indicate the presence of potentially hazardous conditions:



DUAL POWER CORDS CAUTION:

"THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS TO COMPLETELY REMOVE POWER FROM THIS UNIT."

"ATTENTION: CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. DÉBRANCHER TOUS LES CORDONS D'ALIMENTATION AFIN DE COUPER COMPLÈTEMENT L'ALIMENTATION DE CET ÉQUIPEMENT".

DIESES GERÄT HAT MEHR ALS EIN NETZKABEL. VOR DER WARTUNG BITTE ALLE NETZKABEL AUS DER STECKDOSE ZIEHEN.



Any surface or area of the equipment marked with these symbols indicates the presence of electric shock hazards. The enclosed area contains no operator-serviceable parts.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

DOUBLE POLE FUSING

CAUTION: DOUBLE-POLE /NEUTRAL FUSING.

ATTENTION: DOUBLE POLE/FUSIBLE SUR LE NEUTRE

NOT FOR EXTERNAL USE

CAUTION: NOT FOR EXTERNAL USE. ALL RECEPTACLES ARE FOR INTERNAL USE ONLY.

ATTENTION: NE PAS UTILISER A L'EXTERIEUR DE L'EQUIPEMENT

IMPORTANT: TOUS LES RECIPIENTS SONT DESTINES UNIQUEMENT A UN USAGE INTERNE.

VORSICHT: ALLE STECKDOSEN DIENEN NUR DEM INTERNEN GEBRAUCH.

HIGH LEAKAGE CURRENT

To reduce the risk of electric shock due to high leakage currents, a reliable grounded (earthed) connection should be checked before servicing the power distribution unit (PDU).

Observe the following limits when connecting the product to AC power distribution devices: For PDUs that have attached AC power cords or are directly wired to the building power, the total combined leakage current should not exceed 5 percent of the rated input current for the device.

“HIGH LEAKAGE CURRENT, EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY”

“HOHER ABLEITSTROM. VOR INBETRIEBNAHME UNBEDINGT ERDUNGSVERBINDUNG HERSTELLEN”

“COURANT DE FUITE E’LEVE’. RACCORDEMENT A LA TERRE INDISPENSABLE AVANT LE RACCORDEMENT AU RESEAU”

FUSE REPLACEMENT

CAUTION – For continued protection against risk of fire, replace only with same fuse type TCF15, Rated 600V~, 15A. Disconnect power before changing fuses.

Waste Electrical and Electronic Equipment (WEEE)

Information about the Waste Electrical and Electronic Equipment (WEEE) directive can be accessed from the left navigation area of the NTL home page: select **NonStop Computing > Waste Electrical and Electronic Equipment (WEEE)**.

Important Safety Information

Safety information can be accessed from the left navigation area of the NTL home page: select **NonStop Computing>Important Safety Information**. A document window containing a binder of safety information, in several languages, appears. In the document window, click a document title to open the safety information in another language. Local HP support can also help direct you to your safety information.

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